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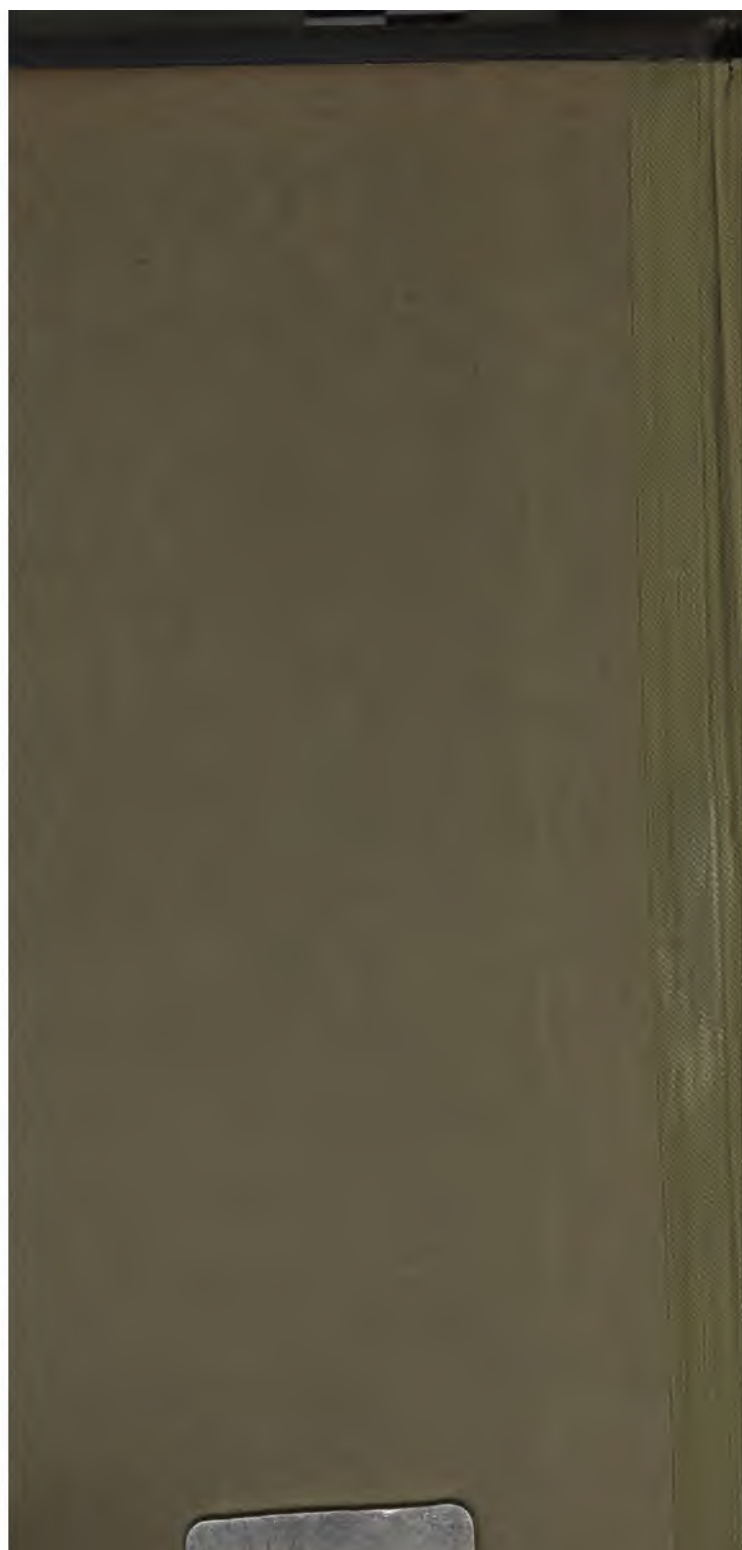
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WILLIAM WITHERING M.D. F.R.S. &c. &c.

*Drawn and Engraved by W. Bond from an original picture
painted by G. F. Breda in the possession of William Withering Esq. F.L.S.*

Francis O. Smith
Northamptonshire
THE

MISCELLANEOUS TRACTS

OF THE LATE

WILLIAM WITHERING, M.D. F.R.S.

MEMBER OF THE ROYAL ACADEMY OF SCIENCES AT LISBON; FELLOW OF THE
LINNEAN SOCIETY; AUTHOR OF "THE BOTANICAL ARRANGEMENT
OF BRITISH PLANTS," &c. &c. &c.

To which is prefixed

A MEMOIR

OF HIS

Life, Character, and Writings.

IN TWO VOLUMES.

VOL. I.

Nisi utile est quod facimus stulta est gloria.

LONDON :

PRINTED FOR LONGMAN, HURST, REES, ORME, AND
BROWN, PATERNOSTER-ROW.

1822.

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TO
JOHN BOSTOCK, M.D. F.R.S.

&c. &c.

My dear Sir,

HAVING been repeatedly solicited to re-publish my Father's Medical Tracts, which have been long out of print, they are at length arranged for that purpose, and several inedited papers added to them.

To these miscellaneous volumes I have ventured to prefix a Memoir of the Author, with an Account of his Works.

In the delineation of character it has been my endeavour to deliver his sentiments on subjects of the first importance,—religious, moral, political, or scientific,—and, as far as possible, to embody them in his own words.

In treating of his literary performances, the

opinions of impartial Reviewers have been principally adopted, as least liable to a suspicion of prejudice.

If, in the execution of this design, the tender bias of filial affection should appear predominant, you, my friend, well know how to sympathize in such a feeling, while with mutual regret we each lament the loss of an invaluable parent: nor, I would fain believe, is it too much to expect from others, that

“ *Professione pietatis, aut laudatus erit, aut excusatus.*”

To whom can I more appropriately dedicate this little Work than to you, by whose encouragement it has been completed;—to you who are so diligently engaged in the cause of humanity and truth.

Recognise, therefore, in this Essay, a token of the cordial esteem which subsisted between our parents being revived in their sons, and an assurance of the sincerity with which I subscribe myself,

Your's, very faithfully,

W. WITHERING.

The Larches,

August 8, 1821.

2. The second section focuses on the role of communication in achieving organizational goals. It highlights the importance of clear and concise communication, both internally and externally. The text provides guidelines for effective communication, such as using appropriate language, listening actively, and providing feedback. It also discusses the benefits of open communication, including improved collaboration and decision-making.

3. The third part of the document addresses the issue of resource management. It discusses the importance of identifying and allocating resources effectively to support the organization's mission. The text outlines various strategies for resource management, including budgeting, prioritization, and delegation. It also mentions the need for regular monitoring and evaluation of resource usage to ensure efficiency and effectiveness.

4. The fourth section discusses the importance of maintaining a strong ethical foundation. It emphasizes that ethical behavior is essential for building trust and credibility with stakeholders. The text outlines various principles of ethics, such as honesty, integrity, and respect for others. It also discusses the consequences of unethical behavior and the importance of holding individuals accountable for their actions.

Teignmouth Devon. 7th Oct: ~

My Dear William

I wrote you a few lines, w
some Plants from Malvern hills &
then off from Cheltenham: At Mrs.
Adwells your Sister collected some e
careous Spars, and I took a view of
Thocks & the Thiver Doon from a poin
which I believe had not been draw
before. These were sent off from T.B.
directed to you - - - - -
- - - - -
- - - - -
- - - - -

I remain, my Dear Boy,
very affect^y yours

Withering

The whole party express their
regards to you.

A

MEMOIR

OF

WILLIAM WITHERING, M.D. F.R.S.

ALTHOUGH the life of a philosopher be little calculated to exhibit those imposing achievements, which render the biographic page dazzling to the generality of readers, it may, perchance, excite the interest of congenial spirits who love to frequent the sequestered paths of literature and science.

Biographical history has, till lately, been too exclusively devoted to the exploits of the great, whilst the memory of less conspicuous, though good men, has been preserved only by vague report, or sunk into utter oblivion.

As the silent, though ample, stream dispenses fertility through its placid course, so the mind of the philosopher, unruffled by vain ambition, and intent on extending the empire of truth and reason, may, perhaps, more essentially conduce

to the welfare of his species, than the hero, who, loudly applauded for problematical deeds, like the mountain torrent, too frequently exhausts his energies in spreading desolation.

The illustration of character from the middle rank of life, has also the advantage of affording example more generally applicable; and, in the present instance, traits may be adduced not unworthy of imitation, which those best acquainted with the subject of this memoir will recognise as genuine.

Customary as it may be to expatiate upon family descent, to trace a remote genealogy in reference to him who disliked ostentation, or the show of adventitious merit, would be irrelevant. Suffice it to state, that the ancestors of Dr. Withering resided on a moderate patrimony in the county of Salop, for several generations.

James Witherings, (according to the orthography of that date, and more anciently Widdrington or Witherington,) of Cheswardine, was succeeded by William, of the same place, who, by his wife Eleanor, left a son named Edmund, born December 30, 1712. He married Sarah Hector, born November 18, 1708, the sister of Brooke Hector, M.D. of Lichfield. From this union sprung a daughter, Mary, born September 1, 1739, who died young; an only son, William, of whom we are here more particularly to treat, born at Wellington, in Shropshire, March 17, 1741, and Sarah, born February 12, 1750, in whose life were exemplified the domestic virtues.

Edmund, the father of Dr. Withering, with agreeable manners and a prepossessing exterior, engaged early in the medical profession, pursuing an extensive practice so successfully as to acquire no inconsiderable reputation in a populous district. He fell a sacrifice to his humane exertions during the prevalence of a contagious fever, in November, 1769. His wife was esteemed a pious and sensible woman, worthy her relationship to that unrivalled critic and exemplary prelate of Worcester, Bishop Hurd. She survived, in a state of widowhood, nearly twenty years, following the fortune of her son, by whom her decease is recorded in terms equally honourable to the filial piety of the one and the worth of the other.

“ July 3, 1789, my mother died, after an indisposition of five days, in the eighty-first year of her age. Her native good sense, improved by education, made her company for the wise, and the placid cheerfulness of her declining years rendered her acceptable to the young to the latest period of her life. Both she and my father were unerring examples of the strictest integrity.”

During his earlier years Mr. Withering benefited by the counsels and instructions of his parents, who lost no opportunity of imbuing his mind with just moral sentiments and the genuine principles of religion. His classical attainments were assisted by a neighbouring clergyman, the Rev. Henry Wood, of Ercall, an erudite and philosophical character, towards whom the grateful pupil retained a deep sense of obligation.

Of anecdotes illustrative of the days of boyhood we have none. Any remarkable occurrences would probably have descended by the partial tradition of relatives; it may, therefore, be inferred that his youth exhibited little of that precocity of intellect, at once so flattering and so alarmingly indicative of a short, though brilliant, career. His juvenile course corresponded with each progressive period of life; more distinguished for steady sense and correct judgement than for the flights of fancy or the eccentricities of genius.

That the son should be educated for his father's profession seems to have been a mutual desire; and thus was he initiated under the superintendence of an experienced and deeply interested practitioner.

At a season when the rational faculties are unfolding, and the intellect is gradually training into full exercise, a defective memory proved an impediment to that progress which might have been expected from assiduity. To strengthen this necessary aid to the acquisition of knowledge, an increasing portion of verse or prose was daily learned by rote; by which habitual effort the retentive powers were so improved as to induce the young student to relinquish the habit of taking notes, which may, in some degree, be regretted; for, relying wholly on the talent thus, as it were, artificially acquired, during the subsequent pressure of urgent engagements, he committed few ideas to paper.

1762.—As the youth is, such will be the man : at home must be imbibed those early important lessons which form the stamina of the future character. Mr. Withering quitted the paternal roof under considerable advantages, and was matriculated of the University of Edinburgh in the autumn of 1762.

He immediately commenced attendance on the lectures connected with the profession he had embraced, devoting himself, during this session, more especially to the courses of Anatomy and Chymistry. His studies were partly directed by an experienced physician, Dr. Hay, at whose house, either in town or country, he was likewise invited to pass the afternoons of Saturdays, in the most improving society. To Campbell, the Laird of Scarrontine, he also acknowledged himself under similar obligations; and thus commenced an acquaintance with several Scottish families, whose characteristic hospitalities not only enlivened his then leisure hours but ever after endeared the recollection of Scotland. So long as he lived his gratitude omitted no opportunity of testifying an undiminished regard for those friends who had countenanced his first introduction to the world.

Nor did the extraordinary assemblage of interesting objects displayed in the metropolis and its environs fail to amuse the observant traveller; the high towering houses forming, as it were, perpendicular alleys; prospects diversified with mountains, waters, and plains not denude of

wood; the vestiges of national costume, and, not least, the attractive *coteries* of what may there, with peculiar propriety, be termed the *fair sex*, whose *naïveté*, wit, and beauty could not but prove alluring.

Under circumstances so novel and agreeable it is not surprising to find him addressing his parents in a strain of no ordinary complacency.

“ My dear and honoured parents,

“ If being possessed of a mind content in its present station, and looking back with pleasure on the past, can give a foundation for happiness, I may be pronounced one of the happy few : and I cease not daily to implore the continued protection of his providential care, which has hitherto supported me, working all things for my real advantage.

“ May that Almighty Power preserve you, my dear parents ; grant you health and length of days ; and may you still offer up your prayers for him who hopes to approve himself not only verbally, but really,

“ Your dutiful son.”

The free and accepted masons yet flourished much more extensively and respectably in the northern than in the southern portion of the island ; indeed to be associated with that fraternity had become a general recommendation ; Mr. Withering, therefore, joined the lodge assembling in Edinburgh.

During the same session he was elected a member of the Medical Society, an institution more congenial with his immediate pursuits, as affording the means of increasing his own knowledge, and of cultivating an intimacy with the most meritorious students. He was admitted with Percival and Arnold, and soon proved himself possessed of a fund of information which was deemed an augury of future fame.

Another establishment was now about to be formed, interesting to the zealous student. Hitherto the University had possessed no library; when, under the auspices of Principal Robertson, it was resolved that each member should contribute a small admission fee, to be solely appropriated for this purpose; and thus originated an increasing fund, which has amply fulfilled the intention.

To benefit effectually by attendance on the lectures, many hours were devoted to transcribing and digesting abstracts of each course. For the completion of these, and in reading, necessarily connected therewith, he too frequently consumed more than the "midnight oil." The fairly written folios and quartos, illustrated by neatly executed drawings, which still remain, assert both his industry and ingenuity. His "*Adversaria*" alone contain nearly a thousand folio pages, alphabetically arranged according to their respective subjects.

Scarcely inured to such unremitting and sedentary labours, his health began to suffer, till, in

lieu of those rural sports he had formerly enjoyed in Shropshire, he participated in the national game of golf, which seems to have succeeded to the more noble pastime of archery, but with little pretension to rival that amusement.

1763.—The long recess, with the most lovely season of the year, enabled Mr. Withering again to partake of the joys of home. Accompanied by a few fellow-students, including his friend Arnold,* he embarked, at Leith, on board a small vessel bound for London.

The bulwark of perpendicular rocks, extending almost uninterruptedly along the coast, the vast expanse of ocean, the occasional glimpse of towns and inland prospects, the passing fleets, and, to crown all, the forests of masts, and the unceasing bustle on the river Thames, were objects of surprise and delight to the inexperienced voyagers. The summer was spent among his relations and friends, and not without the reiterated admonitions of his maternal uncle, Dr. Brooke Hector.

After several months of comparative relaxation, Mr. Withering, with renewed zeal, returned to his *alma mater*. This journey was performed on

* Thomas Arnold, M.D. author of "Observations on the Nature, Kinds, Causes, and Cure of Insanity."

horseback, with the same chosen companion. The diary, from which the incidents recorded in this portion of the Memoir are derived, was renewed; and, from the various remarks, he appears to have been all eye, all ear, yet not indiscriminately so.

The entertainment, whilst on a visit to Mr. Bolton, near Halifax, was both hospitable and scientific. That gentleman's collection of papilios, phalænas, birds, plants, and other curiosities, was viewed with interest; as likewise the ingenious processes connected with the staple manufacture of that district; the milling, teazleing, shearing, and fumigating of woollen cloth. Mr. Bolton is designated as "a man in whom the social virtues shone with distinguished lustre, accompanied with an extensive knowledge in mathematics, and an eager and successful taste for natural history; the correspondent of Collinson, Miller, and Hudson."

The antiquities of York were inspected under the guidance of Mr. Fowler,* from the Manor House, now mouldering in ruins, but once the seat of Edgar, who from hence checked the incursions of the Scots and Northumbrians, to the Minster, still upheld in pristine magnificence, and properly indeed the "*Domus Dei*," if the appellation be due to any effort of human skill.

* Subsequently a physician; author of a "Treatise on the Medical Uses of Tobacco." He also introduced a mineral (Arsenical) solution for the cure of Remittent Fevers.

Nor amidst such diversified scenes were those by whose indulgence he reaped the harvest of improvement forgotten. The evenings were devoted to their amusement, by transmitting accounts of his progress.

If there be any truth in heraldry, or in the tales of other times, the border country must have been peculiarly interesting, for there had the Witheringtons joined in bloody foray with the Percies and Douglasses. The most memorable spots were sought out; and after traversing an uninhabited and almost trackless desert, with the exception of the "pleasanter banks of the Tweed" about Kelso, the equestrians reached their destination.

The lectures Mr. Withering now attended were those on the *Materia Medica*, the Theory and Practice of Physic, and Chymistry, which, with an incidental Clinical course, would have afforded ample employment to a less active mind. He nevertheless, by a methodical appropriation of almost every hour, found opportunity to cultivate those accomplishments which adorn the scholar. Though enjoying an agreeable social circle, and invited to participate in the festivities of a gay city, his established habits of application suffered no interruption. His favourite recreation was attendance on the societies in which improvement was promoted by free inquiry and philosophical discussion.

His fondness for music was fostered by the general taste of the North, which had been

refined with the graces of the Italian school, by the ill-fated Rizzio. The wild harp of Erin; the pathetic strains of the Welch bards; the animating pibroch, rousing the Caledonian to martial deeds, or softening into the tender "Lament," have no parallel among the Southrons. England alone is devoid of music strictly national.

Mr. Withering excelled on the German flute, and was likewise a proficient on the harpsichord: he well understood the science of music, and wanted only leisure to have become a fine performer on several instruments.

The art of drawing does not appear to have been equally fascinating to him; he, however, became no mean connoisseur in paintings, and was versed in the principles of perspective. To facilitate the practical part of the subject, he contrived a machine which was constructed and used with success, and which he thus describes:

"Books of perspective," he remarks, "are either insufficient, or they enter so deeply into optical theory and mathematical rules, that, however demonstrably true, they are not practically so, and hardly apply to any but regular architectural figures. If we accustom ourselves to consider every thing we see as referable to an opaque vertical plane placed behind, or to a transparent plane placed before the objects, I think we cannot fail to conceive just ideas of their true perspective.

"I have often thus succeeded in conveying to

learners all that need be acquired ; but as abstract ideas are not always comprehended by them, I make them view objects through a pane of good glass, plate glass is the best ; the eye must be applied to a small hole about the size of the pupil, in a plate of metal, the size of a shilling, supported* at the distance of eighteen inches from and parallel to the pane of glass. The pane should have some lines drawn upon it truly horizontal, and others truly perpendicular. The distance of these lines should not exceed an inch, and they may be drawn with a common diamond pencil."

With this ingenious instrument he quickly reduced objects to an infallibly correct perspective.

Nor did he unfrequently attempt the lighter kinds of poetry. Under a fictitious signature several of these fugitive pieces found admission into the periodical publications of the day ; but candour must acknowledge that they displayed more of the art of the scholar than the fire of the "*poeta nascitur*." He was, nevertheless, deeply impressed with the sublime descriptions of Ossian ; and, whilst contemplating the original scenes which were at that time supposed to have inspired those extraordinary productions, was not unsuccessful in his imitations of that peculiar style of composition.

On Sundays he generally attended the minis-

* By an upright pillar.

try of Dr. Robertson, or the Episcopal chapel. The evenings were often passed at the house of Dr. Cullen: nor was the kind of reading most appropriate to the day omitted; and interesting discussions on religious topics sometimes arose, in which the constant companions of his studies and recreations, Arnold, Bostock,* and Rogerson,† participated.

His own pious sentiments may be in some degree collected from an extract of a letter to his parents, on their doubting the prudence or safety of certain measures he was about to adopt.

“As to your supposition, I can only observe that the unerring hand of Providence orders all things for the best; and, perhaps, to anticipate misfortunes, may be infringing upon the goodness of the Deity. I am inclined to think that a distrust in Providence is a frequent cause of our calamities.”

Here we perceive the influence of religious impression, which, if ever it prove effective as a rule of life, must be ingrafted before the

* This amiable young physician had scarcely settled as a practitioner in Liverpool, married advantageously, and become possessed of a son, (who has amply enlarged the dawning reputation of his father,) than he sunk beneath an incurable disease, himself predicting the fatal termination, calmly resigning the sweetest blandishments of life, and in his last moments emulating the exit of a Socrates or a Seneca.

† First physician to the Empress Catharine of Russia, counsellor of state, &c.

passions, which ought but to be as wings to the virtues, have acquired irresistible force.

The most worthy congenial pursuits form the strongest bonds of attachment; hence, many of these early acquaintance ripened with time into genuine friendship. Nor did he fail to urge, as far as circumstances would permit, a personal intercourse with those whom he so highly esteemed.

Addressing one of these long afterwards, he says:—"Let me see you, if possible, for a day or two before the winter sets in; the yearly commerce of a few social evenings wonderfully brightens the chain. For some years we must not hope to enjoy again that learned leisure which we have had: hasten then to accelerate the return of those hours, which, perhaps, we prized too lightly when present, or did not sufficiently relish, from not having drank deep enough of the turbid cup of life."

And to the same friend, at a subsequent date:—

"Your letter was the more welcome, as it contained so many particulars of yourself and family. Details of that kind are absolutely necessary when friends are out of reach of each other; and, without them, the changes which time effects in the circumstances of both, would ultimately tend to obliterate the old established associations, on which the permanency of friendship so much depends."

On the other hand, Dr. Walter Jones, of Virginia, though engaged in the complicated duties

of a legislator and physician, in writing to Dr. Withering, feelingly alludes to those happy and unsophisticated hours, when the mind, pure in itself, looked for sincerity in others, and scarcely suspected the prevalence of evil.

“ Absence, time, country, climate, have nothing to do with the affections. If such friends lived in Pegu I should love them a thousand times better than hundreds at my very door.”

Were it not for this amiable warmth of disposition, how little chance would such attachments have of becoming permanent! and thus of yielding a mutual and refined gratification.

1764.—Among the inmates of the house in which Mr. Withering lodged, he found an entertaining companion in an elderly lady of the name of Tulloch, well read, and replete with family anecdote, a kind of knowledge in which the matrons of the North usually pride themselves. From her was derived an historical fact, which, probably, being little known, and affording a noble instance of devotion on the part of a gallant Scotsman to Prince Charles Edward Stuart, (who, however unsuccessful in his attempts to seize the sovereignty of these kingdoms, reigned in the hearts of the faithful highlanders,) may be here inserted.

The Prince in his flight, after the battle of

Culloden, sought shelter in a wood, accompanied by David Tulloch, Rory Mackenzie, and a few others. The wood had been invested for some days by the King's troops, when the Duke of Cumberland received positive information that the object of pursuit was there concealed. The soldiers were divided into thirty companies, with orders to penetrate from as many different points. The refugees, observing the approach of their enemies and finding escape impracticable, resolved to die like heroes; but Mackenzie prepared for a still more generous sacrifice. Having prevailed on his companions to ascend a large tree, he himself remained below, feigning to be the young Chevalier. He was discovered stretched on the ground, and instantly commanded to surrender; when, starting up, and drawing his claymore, "What!" he exclaimed, "do you not know your Prince?" at the same moment rushing forward with desperation, he cut down two of his opponents before he fell, overpowered by numbers. His head was severed from his body, and, having been declared to be that of the unhappy Charles, even by the barber who had shaved his Highness in Edinburgh, was conveyed to London, where the mortifying mistake was detected.

When the mother of Mackenzie was informed how gloriously her son had fallen, raising her hands and eyes towards heaven, she fervently ejaculated, "Oh! had I a hundred sons so devoted to the good cause, I should rejoice could they thus save the life of their Prince."

Many were the instances of brave and good faith, while yet events were recent, recited with exultation; but perhaps no example of heroic virtue exceeds the one above narrated, in which the loyalty of the son is scarcely more admirable than the fortitude of the mother.

During this session Mr. Withering was instrumental in forming a society, under the name of the "*Sodalitium Romanum*," which assembled weekly, for the purpose of acquiring a facility in speaking the Latin language. Though the discussions were chiefly *de re medica*, the promptitude of expression thus obtained proved serviceable on various subsequent occasions in promoting an intercourse with learned foreigners.

Early in the year 1764 his first original essay on *Topical Blood Letting*, which contained some ingenious observations, was read before the Medical Society; and, soon afterwards, a treatise on *Inflammation of the Pericardium*, which drew forth an encômium from Professor Cullen, who, condescending to take part in the debate, supported the ideas of the author.

It was the unceasing endeavour of Dr. Cullen to encourage every laudable effort. His labours in the principal medical chair, and his publications, have stamped his reputation for zeal and science; but the generosity of his soul, displayed in unceasing kind offices, can only be justly appreciated by those who had the happiness to dwell within the sphere of his benevolence. Respecting this eminent Professor,

Mr. Withering thus expresses himself:—" His affable disposition, as it were, engages us in the pursuit of knowledge; his modesty is such, that whatever he advances as new he cautions us thoroughly to examine, and only to embrace with

' A slow-consenting academic doubt.' "

Henceforward Mr. Withering took a more ample share in the discussions of the Medical Hall, and, though public oratory was no object of ambition with him, he could not but derive advantage from the acquirement of that self-possession, without which even the sentiments delivered in ordinary conversation lose much of their effect.

He likewise communicated to the same society a *Latin Commentary on an Aphorism of Hippocrates*, forbidding sudden changes in diet and exercise; also a dissertation on *Dropsy*, a disease for which he afterwards had the good fortune to bring into notice one of the most approved and valuable remedies. These were followed by a treatise on the causes, diagnosis, and cure of *Rickets*, a practical history of *Angina Inflammatoria*, and another *Aphorism*.

About this period commenced an intimacy with Mr. Pulteney,* who came to Edinburgh for the

* Richard Pulteney, M.D. F.R.S. author of " Historical and Biographical Sketches of the Progress of Botany in England."

purpose of graduation, and whom he designated as "a modest man, of true merit and extensive learning."

Whether Mr. Pulteney was then attached to the science of botany does not appear; but in Mr. Withering we have a remarkable instance of the versatility of taste, or rather, perhaps, of the influence of prejudice. He who afterwards became the author of a work, not inaptly described as "the most elaborate and complete National Flora of which any country can boast,"* has this expression in a letter to his parents:—

"The Botanical Professor gives annually a gold medal to such of his pupils as are most industrious in that branch of science. An incitement of this kind is often productive of the greatest emulation in young minds, though, I confess, it will hardly have charm enough to banish the disagreeable ideas I have formed of the study of botany:" so little did he foresee that this depreciated pursuit should prove to him a principal solace in beguiling the heavy hours of protracted disease.

At the conclusion of this second session he again had recourse to his favourite mode of travelling, and explored whatever was worthy of attention in a devious ramble southward. The most attractive feature of the north, on this occasion, was the dreary region of Ericstone Bray, so

* Annals of Medicine, 1799.

called from Ayrick, a king of the Picts, having there met his death in battle, and also remarkable as giving rise to three principal rivers—the commercial Clyde, the classic Tweed, and the pastoral Annan. This tour included the romantic scenery of Buxton, and the Peak of Derbyshire, which were viewed with the eye of an enterprising novice in mineralogy.

1765.—After having visited his friends in different parts of the country, some months were passed in attendance on the hospitals and other medical schools in London; whilst his favourite amusement was the stage, at that time adorned by the talents of Garrick and Cibber; and hence was probably derived that taste for theatricals in which he was afterwards prone to indulge.

1766.—With the commencement of this year began the more regular studies of the third session, at Edinburgh, which consisted of the Anatomical, Pathological, and Chymical lectures. So anxious was he to excel in the approaching examinations, that he scarcely allowed himself necessary recreation.

He, however, devoted a day to the general assembly of the Kirk of Scotland, whose proceedings were to him entirely novel. The King was therein represented by the Earl of Glasgow; each Presbytery deputed one minister, besides whom were admitted a proportion of laymen, as ruling elders, together with his Majesty's Solicitor and Attorney General, the Lord Chief Justice, the Lord Provost, and a few others.

Before this solemn court are investigated all charges against ministers, and matters affecting the discipline of the church, or the morals of the people. The question under immediate consideration was the cause of schism, stated to be an increasing evil, the numbers at that time separated from the kirk being computed at one hundred and twenty thousand. The debates commenced at ten o'clock in the morning, and were prolonged till nine in the evening, during which the young auditor was deeply interested by the force of argument and oratorical powers of some of the speakers, and the curious facts developed.*

Having become acquainted with the medical

* This conference was rendered peculiarly impressive by an awful event. Dr. Jortin, an ancient divine, fell down dead in the midst of the assembly. So great was the shock to his aged partner, that she survived not many hours. Their obsequies were performed together; and, to complete the domestic tragedy, the favourite servant of the Doctor was at the same time accidentally killed.

practice of England, Mr. Withering could the better form a judgement of the prevailing opinions in the northern school; and, highly as he prized the singular advantages there afforded in prosecuting his professional studies, he suspected that system was carried to an extreme, whilst in London, perhaps, too little attention was paid to it.

He conceived the favourite theory, much as it was admired, and generally as it was adopted, to be founded in error; the superstructure, therefore, though beautiful, he predicted must fall; but, in consideration of the ingenious author, he could not but lament that truth should require the sacrifice.

The doctrine of the Brunonians, which since prevailed, had, in his view, some striking and simple beauties; "but," he remarks, "it is not a few prominent features, however symmetrical, that can indicate thoroughly the ever-varying physiognomy of disease."

It may be matter of regret that his own precise ideas are unknown; or it perhaps may not unjustly be concluded that, amidst the multiplicity of his active pursuits, they scarcely attained a decided consistence. Certain it is that he judged both these hypotheses inapplicable to the phenomena of nature.

Prepared to offer himself as a candidate for graduation, he chose for the subject of his inaugural dissertation the "*Malignant Putrid Sore Throat.*" This thesis cost him much labour. It

comprehended both the opinions and practice of the best writers, with the suggestions of the author himself, and was allowed to possess a higher degree of merit than the generality of such compositions.*

In gratitude to his early instructors, Mr. Withering dedicated this little performance† to Dr. Brooke Hector and the Rev. Henry Wood.‡

Having passed his several examinations with credit, he obtained the degree of Doctor in Physic on the thirty-first of July, 1766.

Thus honourably terminated his academical career; and it may be truly affirmed that he passed through the ordeal without any dereliction of principle. However fascinating the applause acquired by brilliant talents, literary distinction, though praiseworthy in itself, was not with him the primary object. He valued the affections of

* The principal parts being included in a subsequent treatise on the Scarlet Fever and Sore Throat, with the result of greater experience, the thesis is not reprinted.

† "*De Angina Gangrænosa.*"

‡ "Avunculo meo plurimum honorando, viro vere erudito, artibus ingenuis ornatissimo, BROOKE HECTOR, Lichfieldiensi, M.D. propter animum amicissimum, quo me meaque studia semper fovit :

nec non,

"Reverendo admodum viro, HENRICO WOOD, literarum humaniorum cultori, præceptori fidelissimo, annorum puerilium custodi sedulissimo, monitori liberrimo et amicissimo, ob optima in studiis excolendis consilia, beneficiaque innumera in me collata, hanc dissertationem medicam, grati animi monumentum, dicatam volo.

GULIELMUS WITHERING."

the heart more than even the qualifications of the head, and launched into the world an unsophisticated character, with the recommendation of unsullied integrity.

His feelings, on tracing for the last time those favourite scenes in which he had with

“ A friend, or book, the stealing hours secur’d,
“ And mark’d them down for wisdom,”

as also in bidding a long farewell to his many valued acquaintance, were those of tender regret; nor was the joy with which he was welcomed home disproportionate.

The fashion of exploring the more romantic parts of the island was not then so prevalent as it has been of later years; the study of the picturesque claimed little general attention; and few travellers deviated even a dozen miles to view the enchanting scenery of the English lakes. Still fewer penetrated the more remote highlands, though doubly interesting, as affording examples of the genuine sublime to the eye of taste, and stupendous phenomena to the naturalist.

Dr. Withering, therefore, quitted the north without having beheld those objects of admiration which have since so amply compensated numerous tourists. He was not, however, ignorant of the geological history of that mountainous district; and, judging from general description and specimens with which he was supplied, conjectured that “ the great extent of basaltic

columns and the immense masses of whin-stone (trap of the Swedes) have a common origin, which may have been volcanic, though some difficulties must be removed before such a theory could be received as altogether conclusive."

Whilst making a short stay in London, Dr. Withering, by the kindness of Dr. Morton, obtained free access to the British Museum; and in September proceeded to Oxford, in company with Dr. Griffin, by whom he was introduced to that University. He had likewise much pleasure in paying his respects to the learned Dr. Lewis,* at Kingston.

He was now advised to make a trip to the continent. The French capital was the centre of attraction, the "*arbiter elegantiarum*," and, while not deficient in medical science, in surgery it was unrivalled. The language was also a desirable acquisition, though he was apt to "deem it a heavy task, during the short space of our existence, to be compelled to learn so many signs to indicate the same thing."

An additional inducement to visit Paris was an invitation from the Surgeon in Ordinary to the King of France, with whom he had formed an

* Author of the "*Artium Commerciale*" and the "*New Dispensatory*."

intimacy in London, and who, most politely, offered to promote the object of the Doctor's researches by all the means in his power.

To this scheme Dr. Withering's parents at first felt some repugnance, unwilling that their only son should encounter even imaginary dangers abroad, or delay taking that station for which they believed him to be already qualified. Their apprehensions were, however, overcome by a further appeal, and the permission was thus acknowledged :

" In return for the tenderness you have always shown for me, let me assure you it shall ever be my study to render your lives agreeable and happy ; and I doubt not but the day will come when you shall confess that the expense bestowed on the education of your son, and the anxieties felt during his absence, have been amply repaid."

For this excursion, so promising of pleasure and improvement, he recommenced his journal, from which we shall trace his progress.

In Mr. Townshend, a gentleman of independent fortune, familiar with the manners and language of the French, he found a well informed companion ; and a fair wind and fine weather ensured an agreeable passage to Boulogne. That town, to Dr. Withering's view, bore a general resemblance to the irregular and romantic aspect of Bridgnorth. It abounded with English and Irish residents, and many reduced officers, enjoying together a sociable intercourse upon the most economical principles. Indeed

the cheapness of the necessaries of life, and the frugal habits of the first circles surprised the strangers, who at the Assembly Rooms were invited to play farthing fish, and to contribute one shilling each for the expenses of the evening.

On visiting the Ursuline nuns he had the gratification to see an English young lady preparing to quit the Convent, in which she had been placed for education. Her transport of joy fully proved the mortification she had experienced in an asylum which the Doctor could not but consider most unfavourable to British sentiments, and ill adapted to the daughters of liberty.

Cæsar's camp, in the immediate vicinity, was an object of attraction. The circumvallation, except where washed away by the encroachment of the sea, remained nearly complete; and here was the principal depôt of the Roman general whilst he effected his descents upon Britain.

The remarks upon the face of the country between the coast and the capital will not be found inapplicable even at the present day.

"The land exhibits a high state of cultivation in every part, though not all enclosed. The trees are neither numerous nor of large dimensions. The farms being chiefly in tillage, few sheep or horned cattle are to be seen. The soil is generally of a light description; in many places chalky, intermixed with nodules of flint. The prevailing crop is barley, which, though rarely used for malt, supplies the only material for bread. The horses are small and in poor condition. At Paix, a

labourer thrashing in a barn said his earnings were equal to sixpence a day and his dinner; nearer Paris wages are higher. No fuel is to be procured but wood, and that is expensive. Between Abbeville and Beauvais are frequent orchards of apple trees, yielding abundance of indifferent cider, which sells at the low price of three farthings a pint."

In the neighbourhood of Beauvais vineyards were first noticed. "The plants are trained up poles about five feet in height, and placed at small intervals. Here the soil becomes of a sandy quality, abounding in small pebbles, the chalky earth having disappeared."

The artificial manners of the Parisians, too generally made up of grimace and frivolity, were by no means agreeable to our tourist. To him the more genuine politeness of the provincials had far greater charms.

On first view of the city Dr. Withering greatly admired the beauty of the stone buildings free from the discoloration of smoke, but was disappointed with the Seine as a river, and the Pont Neuf as a bridge. The vast dimensions of the Louvre, and the gait of the Tuileries during the evening promenade, the numerous statues, the neatly dressed walks and parterres, the lofty trees, the crystal fountains, and the splendour of the company, fully answered his expectation.

The hospital of the Hotel Dieu contained three thousand patients, inconveniently crowded; but in other respects the management was better than

has been reported of that immense institution. Here even superstition is rendered subservient to humanity; the Pope's bull, countersigned by some of the greatest names in France, granting absolution for all sins committed by those who shall personally administer to the comforts of the sick.

The unrivalled manufacture of tapestry at the Gobelins, where the subjects are copied from the *chef-d'œuvres* of the best masters, met with due attention; nor were the wonders of Versailles omitted. The imposing architecture of the palace; the gallery, seventy-four yards in length, displaying the victories of the ambitious monarch, by Le Brun, and adorned with other matchless works of art, were thought transcendently beautiful.

Paris viewed from the top of Notre Dame, as London from St. Paul's, but through a less hazy medium, afforded a more distinct and striking *coup d'œil*, though appearing to be only about two-thirds the extent of the latter.

In the Royal Academy of Sciences the Doctor had the satisfaction to hear the celebrated Abbé Nollet* lecture on natural philosophy.

The pleasure of this excursion was but too soon interrupted by the distressing illness of Mr. Townshend. Dr. Withering, however, was much

* Author of "*L'Art des Experiences*," and other philosophical works.

indebted to a mutual acquaintance, M. La F——, who proffered his services as *cicerone*.

With him and another vivacious Frenchman some interesting conversations were held ; but on one important topic they decidedly disagreed. The dissolute doctrine of expediency had already gained too many proselytes among the Parisians, whilst an avowed system of infidelity shook the foundations of religion, and relaxed all moral principle. The author of both open and insidious attacks upon revelation, whilst resident in their capital as Secretary of Legation, was caressed as “ *le plus beau genie de l'Angleterre* ;” it is not wonderful, therefore, that sacred matters should be treated with irreverence among the *beaux esprits*, or those who affected to be such ;—a practice which our young physician had not learned to tolerate with that easy indifference which may occasionally avoid the collision of argument.

Incidents trivial in themselves tend to the delineation of character ; and the trait here mentioned evinced a commendable and rather unusual consistency, time, place, and circumstances considered. He soon became involved in a controversy with two able disputants, and avowed himself the advocate of Christianity. The arguments on either side were maintained for a considerable length of time ; nor did the discussion terminate till he had fully refuted the objections advanced. He expresses in his diary the satisfaction he derived from this success, not

with the exultation of triumph, but with a hope that he had rendered an essential service to his opponents.

Meanwhile he suffered much painful anxiety on account of the increasing malady of Mr. Townshend, which seemed but too likely to end fatally. In the month of November the Doctor performed the last sad offices to him whilst living and when dead. By this event, he not only sustained a personal privation, but became involved in unexpected difficulties, whilst endeavouring, with a generous friendship, to serve the family of his deceased countryman.

A commissaire having placed the seals of office upon the effects, with the intention of confiscating them, as having belonged to a foreigner dying in the profession of the reformed religion, Dr. Withering, in nowise deterred by menaces, determined to prosecute the affair to a more equitable issue. Much vexatious delay took place, and redress was not obtained without the intervention of the British ambassador; nor even then, till after several unavailing remonstrances, were the seals removed, and the property restored to the rightful owners.

This unpleasant transaction much abated the Doctor's desire of continuing in France, and had the effect of filling his mind with a disgust of arbitrary power, and of kindling that ardent love of liberty which ever after glowed within his breast.

The last letter written to his parents from the

land of despotism, contains the following passage:—

“ I shall for the future enjoy greater pleasure in England than I could have done had I never quitted her shores. Those who have not felt and seen the effects of arbitrary power can never taste with full relish the sweets of liberty. Oh! that those who are discontented with British government were all transported to —.

“ I have much to say; but 'tis not safe to speak. Amongst the greatest blessings I find in France, let me mention a good state of health.”

Dr. Withering acknowledges both the liberality and urbanity of the respective *sçavans* to whom he was introduced. In the medical department of science, he considered the practice less judicious than that of English physicians, excepting in some few particular disorders more prevalent in France; and to the preference of the foreign mode of treatment he attributed the loss of his companion.

Before quitting Paris he was present at a *fête*, which, it is hoped, for the sake of humanity, may be considered as extraordinary. Various animals were baited on an extensive arena, surrounded by raised benches, not for the amusement of the less refined part of society, but for that of the higher orders, and amongst them were many elegant females. Bull-dogs and mastiffs were opposed to each other, and afterwards both united in the destruction of other beasts. Wolves, bears, boars, stags, and bulls were wantonly sacrificed

in combat, and even tortured to desperation by fireworks. The shouts of the savage spectators expressed their exultation at this inhuman scene of butchery; which terminated not with day-light but was actually prolonged by flambeaux.

We may justly exclaim against such sanguinary amusements in what has been considered the most civilized metropolis of Europe; but, whilst condemning the barbarity of our neighbours, let us not hesitate to reprobate, as equally irrational and indefensible, the brutal pugilistic battles encouraged in this country.

Dr. Withering commenced his journey towards Rouen with feelings not unmingled with a sense of mortification and disappointment. Many vineyards, with some plantations, but no large trees, interspersed with a variety of rural seats, or *chateaux*, embellished the prospect on every side. In the second day's route, the scenery still improved; the river Seine gently meandering through the landscape, and reflecting in its glassy surface the chalky cliffs which rose perpendicularly from its margin.

The works of Marli were not passed without exciting astonishment, yet the imposing grandeur of this herculean labour could not banish a reflection on the misapplication of human genius, and the vanity of the ultimate object.

"If," he somewhat ironically remarks, "to remove mountains, and form a new course for a great river; to erect thereon fourteen immense

wheels, which work two hundred and twenty-five pumps, raising eight thousand tons of water in twenty-four hours to a reservoir at the height of six hundred and ten fathoms;—and all this to supply the water-works of Versailles and Marli;—if to do this, and much more than this, be a proof of magnificence, certainly Louis the Fourteenth was deservedly called *Le Grand*.”

He further observes, “ many chalk-hills intervene between the capital of Normandy and Dieppe. Wheat and barley are the prevalent crops, and orchards supersede the vineyards. Manure for the land is conveyed on the backs of horses.”

“ On advancing into Normandy, the characteristic features of the French physiognomy gradually disappear, and a more general resemblance to their neighbours on the opposite coast becomes perceptible.”

Two days sufficed to view the extended pier, the commodious harbour, the citadel, and ancient fortifications of Dieppe;—whence our traveller quickly regained British ground, and landed with a heart vibrating to the language of the poet:—

“ England, with all thy faults, I love thee still,
My country ! and, while yet a nook is left
Where English minds and manners may be found,
Shall be constrain'd to love thee. Though thy clime
Be fickle, and thy year most part deform'd
With dripping rains, or wither'd by a frost,

I would not yet exchange thy sullen skies,
 And fields without a flower, for warmer France
 With all her vines."

Dr. Withering, having received in London the most handsome acknowledgments from the family of Mr. Townshend, hastened to participate in the Christmas festivities at home.

Whether instigated by the religious discussions in which he had been engaged whilst abroad, and the perusal of a few of those paradoxical publications which then attracted attention, or by the devotional exercises to which the season was dedicated, he entered with fresh ardour upon that study, compared to which "all the philosophy taught by the heathens is little more than a dream." He literally "searched the scriptures," comparing the narratives and doctrines of the sacred historians, and inserting annotations in an interleaved copy of the New Testament, till he had the satisfaction to find himself a convert, upon the most independent and rational conviction.

Thus did Dr. Withering, as far as an individual example could tend, remove from the professors of the healing art the stigma of irreligion and contempt of sacred things: and it may be gratifying to call to remembrance, among many enlightened physicians, conspicuous both for their reverence for the tenets of religion and,

as far as circumstances would permit, for the observance of her ordinances, the venerated names of Sir Thomas Brown, Harvey, Sydenham, Arbuthnot, Boerhaave, Stahl, Hoffman; and, in our own time, of a Gregory, a Heberden, and that excellent moralist Dr. Percival. When we observe in men, who of the three liberal professions are entitled to be considered the most learned, conviction arising, and gaining strength in proportion to the force of judgement and serious thought exercised, we feel an impression not only favourable to the class of persons in question but conducive to the general interests of Christianity.

1767.—It now became necessary for the Doctor to decide where he should offer himself as a candidate for public attention. From Chester and Coventry he received flattering encouragement, but neither of them afforded a prospect sufficiently pleasing to induce him to make it his residence.

During this suspense, his skill and assiduity in rescuing a popular character from the point of death gave *eclat* to his early efforts: and, whilst favourable impressions were thus excited, the decease of Dr. Buchanan occasioned a vacancy at Stafford, of which he immediately availed himself. “ Being neither deficient in perse-

verance or activity," as he himself remarked, "he would not willingly spend his life in preparing to begin to live. He already felt that time was on the wing, and that he was not one of the antediluvian race who might trifle away fifty years in a courtship without fearing the departure of youth or dreading to be soon overtaken by old age."

Though for the first few years gaining little emolument, he enjoyed the advantage of the best society that part of the county afforded. His musical talents aided the little *dilettante* concerts which occasionally followed the pleasures of the bowling green at Wolseley Bridge; nor did he hesitate to join the Thespian train of amateur performers, by whom more than one favourite play was represented, with all appropriate scenery and costume, and every accessory which could heighten illusion.

An enthusiastic admirer of the genius of Shakespeare, he repaired a willing votary to his shrine, participating in the jubilee in honour of the Bard of Avon, held at Stratford in the autumn of 1769, under the direction of David Garrick, when the birth-place of "nature's darling child" drew an influx of visitors from all parts of the island. Though the weather was unpropitious to a part of the intended ceremonials, the entertainments were so judiciously arranged that few galas have been productive of higher delight, or impressed a more agreeable recollection.

At Stafford one of Dr. Withering's earliest patients was the lady destined to be his future

bride. After having re-established her health, and been admitted to habits of intimacy with her family, he was permitted in some degree to direct the completion of her education. "The harpsicord, the voice, the pencil, and every exterior accomplishment," he observes, "were already at her command, his study was to extend her taste for literature." Such intercourse ripened mutual esteem into affection, and in the course of a few years his attentions were rewarded with the hand of his pupil.

It is more than probable that his first voluntary researches in the British Flora were induced by the desire of supplying subjects for the highly finished drawings of this lady. For her he explored the enamelled meadows watered by the Trent, the varied lawns of Shutborough, or the wild recesses of Haywood Park; and, being less engaged in severer studies, he became more and more enamoured of the novel pursuit, and soon began to collect specimens for that *herbarium* which he afterwards rendered so complete.

Ever an admirer of nature, the favourite companions of his solitary rambles were Thomson's Seasons, his pocket copy of which he illustrated with a full index. "A fondness for this poetical performance in the juvenile reader," says Dr. Aikin,* "is one of the most unequivocal marks of a pure and well-disposed mind."

* "Letters on English Poetry."

Horace and Tasso, the poems of Miss Carter, and Young's Night Thoughts, were also sharers of his walks.

He now contrived a microscope* more portable and convenient than any previously constructed. It has since been improved, and is particularly adapted to the examination of the minuter parts of plants, insects, chrystallizations, and minerals.

Having experienced the deficiency of English books on the science of botany, here he laid the foundation of his own great work.

1772.—On the twelfth of September Dr. Withering married Helena, the only child of Mr. George Cookes, by Ruth Amery his wife, of a family long established in Staffordshire. This accomplished lady was endowed with a strong natural understanding and an unfeigned piety, which insured an exemplary domestic conduct.

Though the Doctor's reputation was as yet comparatively circumscribed, his feelings confidentially expressed, were the effusions of a heart happy in existing circumstances, and pleased with future prospects. He had already discovered, to adopt his own words, that "much of the hap-

* Described and figured in the "Encyclopædia Britannica;" also in the "Arrangement of British Plants."

piness of life depends upon the facility with which we can accommodate our wishes to our situation, and that by a course of self-conquering exertions, not only our own minds, and in some measure our own bodies, but every surrounding object will be compelled to administer to our comfort. To be resigned to our lot, to elicit pleasure from the present occasion, to command our wills that they yield to the situation, and not to attempt to fit the situation to ourselves,—these are the maxims by which we may live contented, enjoy the blessings which Providence scatters in our way, and be more grateful, more resigned to that Being who desires that all his creatures should bask in the sunshine of his favour.

“ Every individual has a certain *capability* of happiness implanted in his nature ; but whether he possesses all that his nature will admit, must depend very much on the government of himself. He who cultivates this talent to the greatest advantage, is the best Christian, the best citizen, the best man : for he that is happy cannot but be good, and he that is good cannot long be unhappy.

“ The loss of what constituted his happiness will occasion that regret which humanity is never averse from feeling,—other objects may possibly fill the aching void,—these also in their turn may forsake him ; and thus through life does he proceed, till, sooner or later, a convert to his own experience, he looks for more perfect bliss in some other stage of existence, discovers the

goodness of the Supreme Being, and feels the strong necessity for the immortality of man. He repines not at his lot, nor murmurs that Providence has deceived him with a show of unsubstantial good ; for, in a bolder flight, he describes that infinite wisdom, infinite goodness, could never consent that he should feel the fullness of enjoyment in a state where his existence is limited to three score years and ten !”

Though many circumstances conduced to render this portion of Dr. Withering's life agreeable and his situation far from uninteresting, yet, when it is considered that his professional engagements scarcely produced on an average of six years one hundred pounds' per annum, no one will accuse him of an unreasonable ambition in determining to seek a wider field for the exercise of his talents, and where, likewise, the facilities for scientific pursuits would be greater than in a small town.

1775.—During a sojourn of eight years at Stafford, the Doctor's benevolence and urbanity had endeared him to all classes. The poor and the rich regretted his departure. To the patrons of the County Infirmary his services, as sole physician, had been particularly acceptable ; indeed, it would appear, that to his philanthropic exertions the infant institution was greatly indebted

Stafford; and in a very short time, notwithstanding his attention to practical chymistry and botany, it amounted to one thousand pounds per annum.

But these increased exertions were not made without a sacrifice of health. He suffered from an indisposition which, according to his own account, prevented his "doing anything or thinking of anything which could be avoided: an irregular sort of fever kept possession of him for three weeks." This was unfortunately the prelude to many more serious attacks; indeed, the severity of the winter season always deprived him, in some degree, of his accustomed energies.

He proceeded, nevertheless, with his intended publication, and in the summer issued from the press "*A Botanical Arrangement of all the Vegetables growing in Great Britain, according to the System of the celebrated Linnæus; with an easy Introduction to the Study of Botany;*" in two volumes, octavo.

In this attempt to facilitate the knowledge of a fascinating branch of natural history, the author adopted the generic and specific characters chiefly from the works of the great Swedish naturalist, subjoining additional descriptions of his own, with others from writers of good authority. He was attentive, likewise, to mark the economical, medical, or other uses of the different plants, and particularly to note those species which afford nourishment to the animal creation. These observations were the result of experiments frequently repeated in order to obtain accuracy.

Plain rules for the investigation of plants systematically, illustrated by appropriate examples, were also added.

No sooner had this employment ceased than he engaged in others calculated to promote his professional knowledge. As a preparative for these he translated Bergman's Essay, "*De Analysi Aquarum*," illustrating that perspicuous tract with many additional remarks. As an exercise in the delicate art of analyzing waters, he both analytically and synthetically proved the contents of St. Erasmus's Well, near Ingestre, in Staffordshire; the Salt Marsh water in the same part of the country; Rowton Well, in Sutton Park, Warwickshire; and other mineral springs. He also compounded in exact imitation the waters of Spa, Pyrmont, and Seltzer.

His pursuits varied with the changes of the seasons. Before the setting in of winter he thus expresses himself:—"Botany now no longer presides at my board,—her season is past,—and chymistry overspreads the table. I have completely succeeded in the analysis of the Nevil Holt* water, which I can destroy and re-produce at pleasure. It cost me much labour, but has well repaid my attention by the production of a salt not hitherto supposed to exist in the earth,

* Between Market Harborough and Uppingham. The supply of water is usually by drops into a cistern, (secured by a stone arch and an oaken door,) but sometimes producing many gallons in twenty-four hours.

which I call *Muria Aluminosa*,—or shall it be named *Muria Argillacea*? It is formed of marine acid and earth of alum.”

These results were intended for communication to the Royal Society, and might perhaps have recalled public notice to a powerful, singular, and too-much-neglected spring, a great part of the printed accounts of which are proved to be erroneous.

Experiments on the solubility of saline substances, on the Peruvian bark, on human calculi, and other physiological researches, followed in quick succession; whilst his mechanical talents were exercised in the construction of philosophical apparatus, particularly in the improvement of electrical machines, with a view to determine with accuracy the best methods of excitement in the different states of the atmosphere. He became also much interested in assisting the respectable itinerant philosopher Warltire, in devising various novel experiments on the nature and properties of air.

In such ingenious occupations, he found the advantage of living in the seat of the arts, where skilful workmen might be engaged to promote his designs.

At Birmingham, Dr. Withering became a member of the Lunar Society, (so called from its monthly meetings,) which, amongst others, comprehended Dr. Priestley, Messrs. Boulton, Keir, —and Watt, whose abilities and acquirements, in the estimation of Dr. Withering, placed him

“next, if not superior, to Newton.” Thus was constituted one of the best private philosophical clubs in the kingdom, to which *literati* from distant parts were not unfrequently introduced; and nothing could exceed the harmony and diligence of this association, till, in an unhappy crisis, political discussions were allowed to invade the fairer province of science.

Dr. Withering also, during this season, assisted his friend, the Baron Dillon, in completing his account of Spain,* to the chymical and botanical parts of which he added notes, which are acknowledged in the preface to that work.

His constant endeavour being both to promulgate knowledge, and to correct error, he took some pains to ascertain how far the prevalent opinion of the weather being influenced by the lunar phases was consistent with facts. The idea so often obtruded, even in well-informed circles, is fully refuted by a series of observations continued throughout the year 1780, proving that, “of thirteen new moons only five were accompanied with any change of weather; and that of twelve full moons, only four, or at most five, were noted for any alteration.”†

* “Travels through Spain, with a view to illustrate the Natural History and Physical Geography of that kingdom. By John Talbot Dillon, knight and baron of the Sacred Roman Empire.”

† Vide Appendix, No. xix. This fallacy has also been exposed by the late Rev. William Gregor, of Trewarthenic, near Tregony, Cornwall, whose observations, from January 1765, to

The notoriety the Doctor had already obtained induced the frequent communication of discoveries, or matters of consultation, and among the curiosities which were about this period brought to him for examination one or two may be mentioned.

An honest countryman, from a considerable distance, was the bearer of a mass of solid stone, so exactly resembling the human heart both in size and figure, that the good man, by a literal interpretation of Holy Writ, verily believed that he had found the heart of Pharaoh, which "the Lord hardened!" This anomalous production appears to be calcareous, and bears a fine polish.

Another object, perhaps more intrinsically worthy of attention, was a collection of fossil bones sent from Shropshire, found imbedded in the earth near Ketley. They comprised the complete head and other parts of the skeleton of a large animal, which the late Dr. John Hunter ascertained to have been a hunting tiger.* Thus affording a remarkable addition to what have been termed the organic remains of a former world.

the end of 1782 inclusive, marking the new, full, and quarter moons, throughout the whole, lead to a similar conclusion.

* *Felis jubata*, known in India by the name of *Chittah*.

1778.—As at Stafford Dr. Withering had been instrumental to the success of the County Infirmary, so at Birmingham was he called upon for similar aid. The erection of a General Hospital had commenced in 1766, but the funds proving inadequate to its completion, the design had been suspended for twelve years, and was now revived and carried into effect. This extensive edifice, open at all hours to the victims of disease and casualty from whencesoever they may present themselves, stands a noble monument of the spirit of philanthropy for which the inhabitants of that large commercial town have long been distinguished.

At his own house also, on stated days, the poor received gratuitous advice.

When the health of Dr. Ash became impaired, the practice of Dr. Withering, (as an anonymous writer has observed,) “both as to extent and profitableness, equalled, if it did not surpass, that of any other physician out of London.” Had selfish feelings been predominant in his mind, this secession might have proved a cause of exultation; but these two physicians, though contemporaries, were friends, not rivals. Actuated by more generous motives, the departure of an able and kind coadjutor, suffering from an alarming malady, was by Dr. Withering deeply deplored. The sentiments expressed in a letter (dated 1783) are honourable to both.

“I have not been so unhappy for years as this indisposition of my friend has made me. It will

be the most trying event that could, *ab exteris*, have happened to me; and whilst some of my well-wishers may be looking with an eye of complacency at the prospect which his removal may open to me, I am truly heavy at heart for the loss of a man whose virtues and abilities I admire, whilst I hardly see his foibles. The habits of intimacy and uninterrupted cordiality which have continued between us for several years, have attached me to him in a degree I once thought never could subsist betwixt two practitioners in the same town."

Dr. Withering now not only engrossed the chief medical practice of the surrounding populous district, but his journeys extended far into the adjacent counties, and in a few instances he was prevailed upon to make professional visits in Wales. This perpetual travelling, both by day and night, could not but be attended with occasional accidents. In the autumn of 1781, the horses of his carriage having become unmanageable, he imprudently leaped out, and by the fall fractured his collar bone, which, with a concussion of the brain, caused some weeks indisposition.

The many hours unavoidably passed on the road were not idly spent. He read much, and wrote not a little while travelling. Even the dreary nights of winter were rendered in a degree subservient to the acquisition or communication of knowledge, by the burning of a light in his chariot.

To this plan of improving each portion of time

are we indebted for several beneficial publications; amongst which we shall next advert to his "*Account of the Scarlet Fever and Sore Throat, or Scarlatina Anginosa, particularly as it appeared at Birmingham in the year 1778.*"

This formidable disease, resembling in some striking particulars another of a very different nature, and requiring an opposite mode of treatment, proved epidemic during the summer and autumnal season, betraying a degree of malignity, which combined with an ulcerated sore throat, a violence of attack, and train of fatal symptoms hitherto unnoticed by English writers. After having given a distinct history of this disease, followed by an account of the more material observations made by preceding writers, on the species of Scarlet Fever most nearly resembling it, the author points out the characteristic symptoms which distinguish it from other disorders allied to it, and concludes with stating a mode of practice which happily proved eminently successful, banishing the injurious bark and wine treatment founded on erroneous ideas of putridity.

Dr. Aikin, who must be allowed to be a competent judge, describes this treatise as "a piece which I have read with more satisfaction and improvement than any medical publication I have seen for a long time past. I have the pleasure to find that my own opinion of it is confirmed by that of all my medical acquaintance, who think

the description of the disease a model of precision and clearness."

Dr. Percival declares the work to be "written with a degree of judgement and precision that would have done credit even to Sydenham."

The clear discernment, accurate definition, and successful novel practice displayed in this apparently inconsiderable volume, materially tended to increase the author's reputation, and procured him the thanks and commendations of physicians in distant countries, before wholly unknown to him; whilst its beneficial effects were at home extended beyond the limits of the profession, as the following extract of a letter from a clergyman of North Wales testifies:—

"Give me leave to congratulate you on the infinite service you rendered this country last year, by your judicious treatise on the *Scarlatina Anginosa*. The method you laid down for treating that disorder was followed with universal success, by all who had the good fortune to see your book, which I communicated to several."

Whilst thus chiefly devoted to scientific pursuits, Dr. Withering was not indifferent to the political questions then in agitation. To preserve inviolate the Constitution which he venerated, he inclined to advocate a reasonable Parliamentary Reform. The abettor of no particular party, still less the instrument of a faction, he exercised an independent judgement of measures, — neither blindly condemning one, because proposed by a

minister, nor invariably approving another, as originating from an opposition.

To an Ecclesiastical Establishment with an appointed Liturgy he was favourable, as necessary to the well-being of every large community; and of all precomposed services he gave the preference to that of the Church of England. Nevertheless he regretted the imposition of a creed less catholic and more paradoxical than that denominated the Apostles', and thought since the services, originally separate, had become united, they savoured too much of repetition.

He considered the system of Tythes in kind, however sanctioned by ancient usage, as an objectionable mode of recompensing the clergy, and inapplicable to the circumstances of modern times. Into this subject he entered rather deeply. His ideas were so moderate as to be countenanced by several liberal clergymen, though the difficulties in effecting an equitable commutation, he admitted, were not easily to be overcome.

His benevolence was ever alive to the sufferings of the unhappy Africans. He became an active member of the society for promoting the Abolition of the Slave-trade; a commerce which he reprobated as peculiarly disgraceful to professed Christians,—themselves the boasted sons of freedom. That the Negroes are equal to their fairer brethren in mental as well as corporeal powers, few will venture to deny. In the patriot chief Toussaint L'Ouverture,* was exemplified all that is magna-

* See Capt. Rainsford's interesting "Hist. of St. Domingo."

nimonous and honourable in human nature ; in the self-educated Ignatius Sancho an extent of intellect rarely equalled. Truly, says Mr. Jekyll, " the perfection of the reasoning faculties does not depend on the peculiar conformation of the skull, or the colour of a common integument."

In the beautiful apostrophe of Sterne, " It is by the finest tints and most insensible gradations that nature descends from the fairest face about St. James's to the sootiest complexion in Africa ; at which of these tints is it that the ties of blood are to cease, and how many shades must we descend lower still in the scale ere mercy is to vanish with them ?"

1782.—Dr. Withering, having sufficiently experimented upon mineral waters, next applied his attention to such substances as exist in large masses in the earth ; reflecting that the best chymists had almost exclusively devoted themselves to such productions as were rare and curious. For the promotion of this design he abandoned the prosecution of ideas which had led him to the verge of splendid discoveries.

" I am still," he says, " combating that monster *Phlogiston*, and sapping the foundation of his immense dominions. The thing is now so clear that I only want time to venture forth as an author, but am fearful it will not be accomplished." And in another letter he announces, " I

have given up my pursuits upon *Phlogiston* to Dr. Priestley, and am happy to have engaged him in it, for I never should have had leisure to prosecute the numerous experiments it required to ascertain with precision, and enforce on the minds of others, my own ideas."

However mortifying, circumstances compelled him to become the assistant, instead of the principal, in those operose proceedings, and he was satisfied with aiding his philosophical neighbour by frequent conferences. That his own subordinate plan was never fully carried into execution will not excite surprise. Such investigations as were completed will be noticed in course.

The first of these papers contained an "*Analysis of two Mineral Substances, viz. the Rowley Rag-stone, and the Toad-stone.*"

In the southern part of Staffordshire is a range of hills, the highest of which is near a village called Rowley. The summit of this hill has a craggy broken appearance,* and is itself, as well as the fields on each side, to a considerable distance, scattered over with large fragments of the Rag-stone, some of which are sunk deep into the ground. This stone is used for repairing roads, and for paving the streets of Birmingham. It bears an external resemblance to the dark grey masses, the produce of Arthur's Seat, near Edinburgh, which have been almost time immemorial, and still are, transported to London for a similar

* Vide Gent. Mag. 1812, with a plate.

purpose. To a superficial observer the Rowley Rag exhibits a volcanic appearance, and though Dr. Withering at first imagined that it could not be derived from such an origin, he afterwards became convinced that such was its real nature.

The Toad-stone was procured from Derbyshire, where it forms strata, as described by the native philosopher, John Whitehurst, in his very ingenious "Inquiry into the original state and formation of the Earth."

This paper was soon followed by "*Experiments on different Kinds of Marl found in Staffordshire;*" also a "*Letter to Dr. Priestley on the Principle of Acidity, the Decomposition of Water, &c.*"

1783.—During the greater part of the winter these intentions were frustrated by a severe pulmonary affection. From November till March, Dr. Withering laboured on in his profession, and, as he states, "labour indeed it was, till the threatenings of phthisis were no longer to be disregarded, and to save his own life he was constrained to forego for a while the care of others." A total abstraction from business, and uninterrupted attention to his own disorder, succeeded in abating it, leaving only a slight cough, which he expected the approaching summer would remove.

Availing himself of the hospitality of his esteemed relatives, Mr. and Mrs. Pearson, of Tetterhall; in that sweet retirement he for a few months benefited by every assiduity which the most refined friendship could suggest; and which he again experienced at a later period, when the same amiable family so materially conducted both to his pleasure and comfort in a foreign country.

Soon after his return from this temporary seclusion, he had the gratification to find in the circle of interesting characters with which he was surrounded, the celebrated Mrs. Knowles, with whom he indulged in an epistolary correspondence several years. As a specimen of the lively wit of this acute female, we shall not refrain from inserting an extract from one of her letters to the Doctor, which was preceded by the following note from Dr. Moyes,* to whom she condescended in this instance to officiate as amanuensis.

“ I begin with thanking you for your very polite and obliging letter, inclosing the general contents of mineral waters. This specimen of your Notes to Bergman's Chymical Essays renders me,

* This pleasing philosophical lecturer had the affliction to be deprived of sight by the small-pox in his infancy, yet acquired an extensive knowledge of natural philosophy and languages, and was a most agreeable and engaging companion. Dr. Withering had not, among his widely-extended scientific connexions, more instructive or more cheerful correspondents than Dr. Henry Moyes and Mr. Gough, of Kendal, both suffering the like privation. The latter, by extreme delicacy of touch, became no small proficient in practical botany.

if possible, still more anxious for the publication of that most valuable performance. Your health is now, I flatter myself, perfectly re-established ; therefore, I take it for granted, that your translation is going on with an accelerated progress."

From Mrs. KNOWLES to Dr. WITHERING.

London, April 30, 1783.

" *Tell her I am well.*"—The force of this period ran through my vital frame, instantaneous and powerful as an electric shock ; but with this difference, it acted upon me as a sweet surprise that filled me with joy and gratulation !

" Under the affectation of *compulsion* has our sly philosopher retreated from a subject on the doctrine of which he has, I fear, already made up his mind.*

" Women to possess understandings of 'masculine strength,' is an idea intolerable to most men bred up amongst each other in the proud confines of a college. There, indeed, they seem to monopolize *learning*; but, happily, *intellect* cannot be confined ; and, as general education increases, scholars will more and more discover, to the confusion of their pride, that *genius* is showered down on *heads* as seemeth Heaven good,

* Alluding to the contest respecting Animal Magnetism, about which it is imagined several of this lady's learned correspondents presumed to entertain opinions opposite to her own.

whether dressed in caps of gauze or velvet,—in large gray wigs, or small silk bonnets.*

“ Here I blush to observe that my antithesis has accidentally brought forward too picturesquely the poor small head thus sedulously pleading, not for itself, but for its injured sisterhood; for, as to this poor head, it could, alas! rest on its dusty pillow peacefully, bearing only to the haughty eye of the scientific passenger, this simple record. ‘ Here lies—not the poet, linguist, or philosopher,—but one who kept in view *the whole* of her existence :—which view settled her mind into a patient acquiescence in the present false opinions and unjust institutions among men, and enabled her to wait in joyful hope of the great and glorious regulations of a better world.’

“ The foregoing subject has led me very far from what I intended, which was to express to Dr. Withering some part of the pleasure I feel in the consciousness of being *esteemed* by *him*,—but to be *praised* by him is too great a trial of my humility.

“ Yet what meaneth he by his ingeniously supposed feminine characteristic? to wit :—‘ There is, however, a vivacity and a *distinctness* in the operations of her imagination, that mark her for a female.’ Describe this distinctness; give me an illustration, that I may try to trace the symptom to its true source; for much do I ween that

* It is scarcely necessary to state that Mrs. Knowles was a member of the Society of Friends.

it is deducible from circumstances of situation, early habit, and all the *et ceteras* that are pendent on our universal oppression.

“ The amiable Dr. Moyes left my house, which was his home whilst in town, and set off for Norwich, on Saturday last. His converse, lively as improving, rendered his two months residence here, short and pleasant as a midsummer night’s dream.

“ I often told him how lucky for *me* were his peculiar circumstances! To have an oracle so much dependent upon one for the comfort of small courtesies, was indeed very flattering to self-importance. A *seeing* man of his accomplishments would have been, in the splendid regions of London, as evanescent, or to *me* as fleeting as a bright morning cloud borne in full radiance along the gay azure of a May-day hemisphere.

“ For my own part, so much seems it for the interest of my vanity and defects to have great persons blind *to* and *with* me, that I am ready to exclaim, why falls not the obliterating drop upon the eyes of Doctors A—and B—and C—and on to W!”

Early this spring the Doctor likewise received a visit from the ingenious, but unfortunate, Mr. Charles Spalding, of Edinburgh, the improver of the Diving-bell, who, a few months afterwards, (together with his companion, Mr. Watson,) perished in a sub-marine excursion in the bay of Dublin.

Our author next published a translation of the "*Sciagraphia Regni Mineralis*," of Sir Torbern Bergman, under the title of "*Outlines of Mineralogy*."

As a translator, he has not only done ample justice to this chymist in point of accuracy and elegant perspicuity, but has greatly added to the value of the original performance by the introduction of many *Notes*, the result of his own actual experiments.

In this work the arrangement of minerals is founded on the constituent principles of the several substances ; a method which may possibly be improved, but never can be exploded. A new species of Lead ore is therein first described.

About the same time, he communicated to the Philosophical Transactions, "*Experiments and Observations on the Terra Ponderosa*," a novelty in the mineral kingdom, thus first introduced to the scientific world. Besides discovering the composition of the particular specimens examined, the experiments have ascertained some interesting properties of the Terra Ponderosa itself; and also served to correct certain errors in the Tables of Affinity published by Professor Bergman.

The *Aerated Terra Ponderosa* was at first supposed to have been brought from Alston Moor, in Cumberland. It since appears to have been the produce of the mine of Anglezark, near Chorley, which has been described by James Watt, Esq. and, according to the information of that gentleman, this is still the only mine in

England in which any Aerated Barytes or Carbonat of Barytes has been found.* In compliment to the first detector of this rare substance in a native state, Werner has been pleased to distinguish it by the name of WITHERITE.†

1784.—Though Birmingham may justly be considered one of the most healthy large towns in England, extending chiefly over a dry gravelly eminence, with spacious streets, and each house abundantly supplied with spring water; yet the innumerable fires and furnaces, incessantly emitting volumes of smoke, mixed with still more irritating vapours, cannot but vitiate the native purity of the air to a degree injurious to delicate lungs.

* In Wales it is reported to have been found in a mine opened in 1786, on Cefn-meriadog Rocks, in the parish of St. Asaph, preserving its radiated appearance.

† *Terra Ponderosa*, or *Barytes Acrata*, resembles alum, but is hard and striated, as if composed of radiating fibres coming from a centre. Specific gravity 4,338." Cronstedt, sec. xlix. p. 87.

"This substance is a new acquisition to mineralogy, discovered by Dr. Withering, (who examined native specimens found in England,) and may be turned to useful purposes in chymistry. It does not burn to lime, as it melts rather than parts with its aerial acid. It contains 20,8 parts of *Aërial Acid*, 78,6 of *Ponderous Earth*, and the remaining 6 consist of *de Vitriolic Baro-Selenite*, without any water." Hyacinth de Sigellaui, sec. cxciv. p. 383.

To avoid the excitement of so contaminated an atmosphere, and to obtain some respite from incessant fatigue, Dr. Withering accepted the invitation of his valued friend Mr. Boulton, during the temporary absence of his own family, to make Soho his home for as long a time as he should find it agreeable; a proposal which may be esteemed as one among many instances of the cordial regard which was reciprocally cherished. Amidst the sequestered groves of that spot, so dear to taste and the arts, a beneficial repose was obtained, till, in a few months, the Doctor again ventured into the vortex of professional engagements.

During this seclusion, he painfully felt, as he himself states, that "the languor of illness is one of the most mortifying symptoms to those who dislike indolence." Happily, towards autumn, he again experienced that pleasing alacrity in the pursuit of study or of business which health alone can bestow.

The Botanical work having been long out of print, the requisitions of the public and the book-sellers induced him to apply assiduously to the preparation of a new edition. Towards the close of the year, he writes:—"Every leisure moment is employed in *rebus Botanicis*; but, thank God, I enjoy good health, and my spirits never fail me."

1785.—Unexpected circumstances obliged him, for a while, to suspend this design. Information of artifices practiced to mislead opinion respecting the *Digitalis*, both in London and Edinburgh, and the attendant requests of those who knew the real merits of the case, together with the possibility of being superseded by other claimants to whom he had taught the use of it; especially the endeavours of one physician, who most unfairly attempted to arrogate the discovery to himself, compelled Dr. Withering to publish, sooner than he had otherwise wished or intended, "*An Account of the Foxglove and some of its medical Uses; with practical Remarks on Dropsy, and other Diseases;*" wherein, according to an anonymous writer, "he laid before the public a very satisfactory body of evidence in favour of the diuretic virtues of this vegetable; and is entitled to the praise of being the first who taught the faculty how to prepare and manage its doses, so as to administer it with safety, and generally with success."

He found this medicine, by his own admission, to be "a two-edged sword, requiring great circumspection in the management;" but with which he had been in the habit of treating Dropsies with much advantage, several years before he presumed to instruct other practitioners.

If there be any thing meritorious in introducing a new and a powerful medicine into regular practice, of ascertaining its doses, and regulating its exhibition, such merit may be justly claimed for our author. This remedy had been the subject

of much conversation among the medical faculty, and of diversity of opinion : while some admitted it to be of powerful efficacy, others represented it as a virulent poison, possessed of the most deleterious properties. In this volume, there is not wanting evidence of its dangerous operation on the vital actions of the heart, and of its very considerably diminishing the frequency of the pulse. It must, however, be allowed, that, in skilful hands, it has been rendered instrumental in the cure of dropsy after all other means, tried by able men, had failed of procuring relief. The book does not contain a selection of cases calculated to exalt the character of the Foxglove at the expense of truth ; but gives a fair and candid recital of all the effects experienced from it. Like the Father of Physic, he has stated, not only the cases in which he was successful but those, likewise, the termination of which was either unfavourable or fatal. He gives the history of one hundred and sixty-three cases, from his own knowledge, and subjoins the testimonies of respectable practitioners in regard to other patients. A considerable number of the dropsical persons, thus treated, were cured, many were relieved, and some died ; a circumstance which, considering the incurable nature of the causes of this disease, could not but be expected.

Dr. Withering's attention had been directed ever since the year 1775 to contrive some method of disarming the plant of its harsh qualities, and

to render its operation as mild as possible; and in the latter part of the work he proceeds to point out those constitutions which are liable to be injured by the *Digitalis*, and to distinguish those in which its effect is generally favourable. In the last chapter he comments on the different species of the disease. From every part of the work the reader may promise himself instruction.

There is one hint, however, thrown out by this ingenious practitioner (say the reviewers) which strikes us particularly. He conceives the hydrocephalus to originate from inflammation, and that the water found in the ventricles of the brain is the *consequence* and not the *cause* of the illness.

If Dr. Withering be right, and the disease should be found to depend on inflammation or congestion, the curative indications ought to be extremely different in the first and last stages. Accordingly, when called early in the disease, he orders repeated topical bleedings, vomits, and lowering medicines. He succeeded in curing two patients by this method.

The reviewer concludes by acknowledging the public to be under great obligations for the labour bestowed on the subject of this book: a book which, according to the declaration of Dr. Cullen,* "should be in the hands of every practitioner of physic."

After a sufficient time had elapsed for a more general trial of the new medicine, the reports

* Vide Cullen's "*Materia Medica*," 4to. ed. p. 555.

from various parts of the country were highly satisfactory to the Doctor; who was, however, not a little mortified to learn that the result of at least one eminent man's experience in the metropolis had not proved so favourable. On the cases here referred to, which may be read in the "Memoirs of the Medical Society of London," Dr. Withering himself passes the following comment, in a letter addressed to Dr. Woodville, on occasion of his having applied for any further information which he might choose to communicate for the publication entitled "Medical Botany."

"Respecting the *Digitalis* I really have nothing new to observe, nor have I any thing to retract of what I before advanced. Under my own management, under that of the medical practitioners in this part of England, and, I may add, also in the hands of some respectable clergymen in village situations, it continues to be the most certain, and the least offensive diuretic we know, in such cases, and in such constitutions, as I have advised its exhibition.

"I have also the satisfaction to find, by letters from some of the most eminent physicians in more remote parts of the kingdom, that it is equally useful and safe in their hands. But I complain of the treatment the medicine has experienced in London. Its ill-success there cannot be altogether attributable to difference of constitutions. No one can compare the choice of patients with my declaration of the fit and the unfit, or the doses prescribed, and the perseverance

enjoined, with my doses, rules, and cautions, without being astonished that any one could suppose he had been giving this medicine 'in the manner prescribed by me.'

"I am fully satisfied that, had I prescribed it in such cases, such forms, such doses, and such repetitions, the effects would have been in my hands equally useless, and equally deleterious. Had not my injunctions been forgotten, it would hardly have been thought necessary (after perusing the cases X. XI. 1777, and the Hospital cases I. II. III. &c. of my "Account") to have published more instances of what I had stigmatized as bad practice, or to have sought for further proofs that an active and useful medicine might be employed so as to prove a deadly poison."

The suggestions of the author respecting the probable efficacy of this invaluable medicine in certain cases of mental derangement, have been fully verified by more recent practice. The "Report of the Committee of the House of Commons on the state of Lunatic Asylums, 1815," bears incontrovertible testimony on this point, which has been confirmed by various private accounts of the violence of delirium having been decidedly abated, and the confusion of intellect in some instances most happily removed.

Were any further evidence requisite to prove the importance of these researches, none can be more forcible than that of the late Dr. Currie, of Liverpool, contained in a letter to Dr. Withering.

"I have had much experience of the Digitalis,

and have every thing to say in support of your opinions. The regulations for its exhibition, and the limitations which you have fixed to its success, are singularly and strikingly correct; and I consider your work as by far the most valuable addition made to medicine during the last thirty years.”*

Other testimonials, equally conclusive and unprejudiced, might be adduced; but the reader would not have been thus long detained by such a consideration, were it not apprehended that, from the scarcity of the original publication, much ignorance already prevails, and many salutary directions are neglected. Indeed the controversy, not long ago resulting from the case of a celebrated statesman, would justify the supposition that some of the faculty were again experimenting *de novo*.†

Dr. Withering had this year the honour to be elected a Fellow of the Royal Society, to

* It is impossible to allude to the writer of this letter, the unostentatious yet bright ornament of his profession, without yielding to an expression of sincere regret for his too early decease. Though never personally acquainted with Dr. Withering, such was the respect he felt for his character, that, had not the fatal stroke of disease interposed, there is reason to believe ample justice would have been rendered to his merit, in a memoir prepared by the biographer of Burns.

† It may also be proper to remark that, notwithstanding the caution given by the author, and the accurate representation of the Foxglove, prefixed to the first edition of the Treatise, other plants, particularly the Mullein, are still carelessly substituted.

whose Transactions he continued to contribute as occasion offered. The Medical Society of London also presented him with a diploma; and other learned bodies proposed to enrol his name amongst their members. To most of these solicitations he declined acceding, finding an attention to the duties of them incompatible with his other engagements, and disliking sinecurism even in the republic of letters.

Intercourse between different parts of the world being, at this juncture, uninterrupted, England attracted a concourse of foreigners of every description. Few visited the island without extending their tour to Birmingham, where the most ingenious machinery and manufacturing processes might be seen to advantage; at the same time availing themselves of introductions to those who were most likely to afford them information on whatever subjects might be interesting to them.

The Doctor's house became the resort of the most intelligent travellers. To present a detailed list of them were superfluous; but some of those who arrived in the course of a few months only, and from whose acquaintance was derived peculiar gratification, may be named:—as, Petrus Camper, M.D. Professor of Philosophy and Medicine, of Groningen; “not less estimable,” his host observes, “in his private character than eminent in science:” M. Neckar, the financier and economist of France, whose virtues have recently been embalmed by his daughter, the

Baroness de Stael : M. de Calonne, his successor in office : Dr. Reinhold Forster, of Halle, author of the " History of Voyages and Discoveries in the North," and himself a successful adventurer in the coldest regions : the Baron Schoen, and M. Weiss : the Italian Count Castiglioni, the botanical pupil of Scopoli, proceeding to traverse North America, with the intention of transporting the various kinds of shrubs and trees to Tuscany : also, Count Andreani, the first aeronaut who ascended in a balloon in Italy ; together with the Professor of Geology in the Museum of Paris, M. Faujas Saint Fond, (as pleasantly recorded in his " Travels in Great Britain,") author of a very splendid work on the ancient volcanoes in Vivarris. These latter were returning from a visit to the cave of Fingal, in the isle of Staffa, fully satisfied of the volcanic origin of the basaltic columns there to be seen in such magnificent proportions. At that time, Dr. Withering was not seized with what he termed the "*volcano-mania*," and still entertained doubts on the subject.

The above were quickly succeeded by the Abbé Raynal, the historian of both Indies : Dr. Swediaur, an Austrian philosopher, known by his medical and other publications : the Count Otto Cronstedt, a Swedish mineralogist : M. Smeisser : the Prince of Tour and Taxis, a well-informed amateur : M. Schœffer, a botanist : Dr. Muntinge, from Holland : with others distinguished for rank or knowledge ; and, perhaps,

none more remarkable than the diminutive Count Borawlski, a native of Poland.*

During such interviews, he was ever desirous freely to receive and as freely to communicate information. With the inquisitive stranger, he would contrive excursions to some of the neighbouring objects of curiosity; among which, in his estimation, the most remarkable were the basaltic columns and rocks of Rowley; the limestone caverns near Dudley; and though, perhaps, less generally known as such, at least equally worthy of attention, the Lickey hills, in Worcestershire, which exhibit a mountainous mass of granulated quartz; a substance described by mineralogists as existing only in detached pieces.

Disease, during the subsequent vernal equinox, appears to have been remarkably active; and so uninterrupted were his engagements, that, for three weeks together, he could scarcely find the smallest respite from practice. Whether this unusual prevalence of sickness be attributable to a peculiarity in the season, may not be easy to determine; but a fact, recorded by himself, seems worthy of notice, that "from the 8th of January

* This miniature of a man was then forty-seven years of age; only three feet and three inches in height, well made and well educated: "his talents and acquirements," Dr. Withering remarks, "happily bearing no proportion to the scale of his body. Though occasionally submitting to what might be termed a degrading situation, his active mind aspired to philosophical research, and his manners were those of a gentleman, if not a courtier."

to the 23d of May (1785) no rain fell at Birmingham; some snow, but no great quantity."

Though the subject of this biographic sketch possessed by no means a feeble corporeal frame, incessant exertion of body and mind began to impair his natural vigour. He had long been convinced, to adopt his own words, that he had "embraced an anxious and a slavish profession; in which the most successful are better rewarded by the consciousness of doing good than by its most ample emoluments." Truly, the chief encouragement and consolation must be derived from the sentiment of the Roman orator:—

"Homines ad Deos nulla re proprius accedunt, quam salutem hominibus dando."

"Men resemble the Gods in nothing so much, as in rendering benefits to their fellow-creatures."

In 1785, Dr Withering's professional journies amounted to *six thousand three hundred and fifty-three miles*; and for several subsequent years the fatigue rather increased than diminished. Yet it clearly appears, whilst thus engaged—sacrificing health, and ease, and comfort, his fees scarcely exceeded two thousand pounds per annum. The same exertions in London, whither he had been invited with the promise of high patronage, might have proved far more lucrative; but, in all probability, his health would have still more prematurely decayed beneath the oppressive atmosphere of the metropolis. Nor, indeed, was the accumulation of riches so much

the object of his desire as the acquisition of the necessary means of supporting a liberal expenditure; after the attainment of which, to his own irreparable injury, the sweetest reward of his toils was the gratification of conferring obligations on others.

It ought not to be concealed, as a principal cause of the small addition made to his paternal inheritance, that the generous principles which influenced his practice induced him to decline all remuneration from numerous invalids whom ordinary benevolence would have excluded from such consideration, as likewise invariably from certain descriptions of persons above the lowest classes of society.

Instances might be adduced in which his delicate attentions, (so bestowed as to wound not the nicest feelings acutely poignant in adversity,) and the pains afterwards taken to render permanent service to the meritorious family suffering from the caprice of fortune, have called forth the heart-felt declaration of his "unparalleled kindness."

1786.—Persuaded that a residence near Birmingham would be equally well adapted for his professional employments, and more conducive to health than one in it, Dr. Withering had been looking out for a convenient situation, and gradually preparing for removal. At length such a

place offered, by Sir Henry Gough Calthorpe relinquishing Edgbaston; the vicinity of which to the town, and perfect seclusion from it, induced him to engage it.

A delay in the publication of a second edition of his botanical work was thus occasioned, which he himself scarcely regretted, considering such procrastination seldom disadvantageous to an author, still less so to the public; nor did he deem the Latin poet unreasonable in requiring

——“Nonumque prematur in annum.”

Edgbaston Hall, to which he removed in the month of April, was a spacious and commodious mansion, surrounded by a park affording an interesting combination of wood, water, and undulating lawns; nor was the new possessor insensible to these picturesque beauties. The approach of summer in a great degree banished the complaints which had been aggravated by the protracted winter of 1785-6, but unavoidable exertion so increased their tendency that he seldom passed many months without more or less inflammation on his lungs.

It was a fixed maxim with Dr. Withering, so far as circumstances would permit, never to distract his mind by attempting more than one object at a time. “The slow, but necessary processes of botanical investigation,” he observes, “had long excluded other scientific pursuits from his thoughts.” Nor did his labours in that branch

terminate with the summer: the press vegetated all the year, and the calls of the printer for "more copy" continually arrested his attention.

1787.—In the course of 1787 were published the first and second volumes of a new edition of the "*Botanical Arrangement*." In aid of these researches the author retained two persons, whose sole business it was to traverse the country to collect plants. These specimens he carefully compared with the generic and specific descriptions; an invariable practice, from which numerous corrections resulted.

In a variety of instances where truth and nature required it, he did not hesitate to depart from the Linnæan text, particularly in the generic characters, which are more adapted to exotic than to British species. In short, he aimed at nothing less than to produce a standard of British botany; making every possible effort to bring this, his "*magnum opus*," to perfection.

"This ardour," according to his own expression, "arose from the zealous pursuit of a favourite mistress;" though he was sometimes led to reflect that "his attachment to Flora might be as little interesting to the rest of mankind, as a partiality to another mistress of a more common kind; nevertheless, when he addressed himself to those who were or had been acknow-

ledged votaries of the goddess, he did not despair of exciting their sympathy."

In this, indeed, he fully succeeded; for the publication of the third volume, by which this edition was augmented, being deferred till the autumn of 1792 (when it appeared with such improvement as justified the delay); the estimation in which the work was held was indisputably proved by repeated applications, sometimes in the form of civil inquiries, or polite and encouraging addresses; at others by the chiding remonstrances of anonymous writers.

Since the author's decease, the same flattering approbation has been continued; on the whole, nearly ten thousand copies of enlarged impression, (in which the Editor has endeavoured to keep pace with the progress of knowledge) having been required.

His botanical correspondence embraced not a few characters equally estimable for moral worth, as for scientific acquirements. On this basis was established a most gratifying and friendly intercourse, from which was also derived valuable assistance in an undertaking, to which the labour of an individual was scarcely adequate. As an author, his bosom never entertained or admitted those petty jealousies which sometimes tarnish shining abilities; and the candour with which he, on all occasions, acknowledged the discoveries or assistance of others, cannot be more justly described than in the *post obit* testimony of a learned member of the University of Cambridge.

“ Though I never saw my ever-revered friend, your father, yet his candour, his fair, open, ingenuous dealing, his conscientious acknowledgment of any little help, fully gained my friendship and esteem :—and this praise he shall always have from me, publicly and privately,—‘ *sum cuique*’ is my motto.”

The reputation which Dr. Withering had acquired as a physician, a philosopher, and a man, was now at its zenith, and must have satisfied his highest ambition. Already complimented by the mineralogists of Germany, about this period L’Heritier de Brutelle, the distinguished botanist of France, opened the first fasciculus of the fine work, entitled, “ *Sertum Anglicum*,” by conferring his name on a new genus of plants.* From Russia and Holland the meed of praise was presented in the most gratifying form ; whilst from America he received assurance, by the pen of Professor Hall Jackson, that “ thousands were wishing to offer their tribute of gratitude for his indefatigable endeavours for the good of mankind.”

He was not unfrequently consulted from remote countries. Many patients from the metropolis, and other distant parts of Britain and Ire-

* “ In memoriam celeberr. GULIELMI WITHERING, Doct. Med. Soc. Reg. Lond. Soc. &c.

“ WITHERINGIA *solanacea*. Patria assignatur America meridionalis. Hodie viget in Horto Kewensi. Quotannis floret æstate, sed nondum fructus tulit. Hucusque avulsis a matre vivradicibus propagari videtur. In tepidario excolitur.”

Sert. Ang. Paris, fo. p. 33. tab. 1.

land, regularly sought him, and not a few invalids in Paris requested his advice;—amongst the latter may be named the venerable Franklin.*

Nor were it a difficult task to show that Dr. Withering was the physician of the mind as well as the body, instilling the principles of moral rectitude, and strengthening every worthy resolution in those who appreciated his judicious counsels. Many were the difficulties which he solved, frequently with no small anxiety to himself; many were the delicate affairs confidentially referred to his consideration: the heats of passion subsided in deference to his opinion; nor was his judgement ever impeached in the arduous office of umpire. The result was generally a well-merited self-satisfaction on having surmounted obstacles which, but for his prudent interposition, might have produced disastrous consequences, and permanently endangered domestic comfort.

His sincerity was not equivocal, nor ever compromised with that weak complaisance which sometimes induces amiable minds to foster even vanities in the female sex. On beholding a young couple launching into fashionable extrava-

* This extraordinary philosopher and statesman was then resident at Passy, near Paris, in discharge of a diplomatic function, which he continued to exercise till an octogenarian.

gancies, which could not but lead to early embarrassment, he thus ventured on the salutary expostulation :

“ I hope that my young friend - - - - - will learn that vanity and ambition are not productive of happiness. She will not be offended at my freedom ; I never disguise my sentiments ; and she who is endued with so many real excellencies can bear to have her foibles pruned without being too deeply wounded. - - - - -

- - - - - I am still much more pleased, if it be true, that the tide of vanity is fast ebbing from those peaceful shores, which the wild tumult of youthful fancy had caused it to overflow. - - - - -

- - - - - The plan of growing rich partakes too much of romance ; persons of genius never become rich by farming ; such schemes of economy will always render their professors poor.

“ It is quite out of character for a wife in your circumstances to *get* money ; her proper mode of earning is to *save*.

“ I would wish to see a husband industrious in his profession, and by diligence obtain riches in proportion to his abilities ; but the facility with which a man of talent acquires wealth is apt to induce carelessness in the disposal of it.

“ This defect is what a wife should supply ;

she is then acting the part which the world and her own conscience will approve; a part which perfects the character of her husband and renders his labours useful to his family.

“With unrelaxing nerve restrain every propensity to *expensive indulgencies*; look forward to the time when you may, with propriety, enjoy such gratifications; live upon those expectations; and when once you have educated your boys, and provided a competency for your girls, then give loose to your natural disposition, and riot in the luxury of elegance. I will then applaud, nay, join you in the pursuits of pleasure; we will build, we will plant, we will possess the treasures of nature and art, we will travel,—but I must defer the further enlargement of these views to descant upon in a social evening.”

That such was his style of friendly admonition many yet living might attest; and for such benevolent intentions, stronger expressions of gratitude than the following can scarcely be imagined.

“The privilege you have granted me of addressing you is a sacred resource to which I can fly from every adventitious ill: a palladium that will guard me against my own weaknesses, and make me more worthy of the distinction with which you honour me.”

“For some days past the greatest pleasure I have experienced has been derived from the in-

tention of writing to you. Your friendship is the only blessing in this life which I have found without alloy ; it is a resource which seems to bear the nearest affinity to the nature of that dependence which we have on the Divine Being : words, alas ! cannot convey to you an idea of the solace which I derive from you."

And the same superior woman, when supposed to be lying on the bed of death, requested a few words might be "transcribed from her heart, and presented to her revered patron, her philosopher, her friend." "I am indebted to you," she adds, "that I am a happier being, and, I trust, a better Christian, than I used to be."

Were it necessary further to illustrate this part of the character of Dr. Withering, with what delicacy of sentiment does another lady, whose virtues imparted additional lustre to exalted station, prefer the tribute of respect :—

"I have had much pleasure, since my return to England, in finding many persons who seemed to think better of me for speaking as I felt concerning you. Next to the satisfaction of knowing a character so valuable to society, one may surely rank that of meeting with persons who are equally sensible of so much worth and greatness of mind."

Amidst this general applause, vanity never entered into his composition. The wisdom which he possessed tended to enforce humility, exposing the narrow limits of the human capacity, and illustrating that

“ Knowledge and wisdom, far from being one,
 Have oft times no connexion :
 Knowledge is proud that he has learned so much ;
 Wisdom is humble that he knows no more.”

Hence, after meditating on the discoveries and sublime speculations of a great astronomer, and sweeping the starry heavens with his equatorial and other instruments, he exclaimed :—

“ Lord, what is man ! saith the father of the wise man ; but our *modern wise men*, finding their conceptions baffled in contemplating the *creation*, and their own minds unequal to the government of it, sagely conclude that it must have no government at all ! Is not this one of the great sources of the *infidelity* of men who call themselves *philosophers* ?”

So certain it is, as Lord Bacon observed, that “ a little philosophy inclineth man’s mind to atheism, but depth of philosophy bringeth man’s mind round to religion ; for while the mind of man looketh round on second causes scattered, it may rest on them and go no farther ; but when it beholdeth the chain of them confederated and linked together, it must needs fly to Providence and Deity.”

Dr. Withering was neither cynical nor fastidious, tolerating none but his equals. Having himself imbibed that spirit of inquiry which contributes so largely to our happiness, to assist others, gave the highest zest to his acquisitions. Several young men of ardent minds were by him drawn forth from comparative obscurity, and, en-

couraged by his assistance, having become expert naturalists, were recommended to powerful patronage; sent to explore remote and little known countries, to their own gratification and the advancement of science.

Of the advantage of the facilities thus afforded, we may form a just idea from the following extracts of letters from Lady W——, for whom he had prepared an outline of Mineralogy and Chymistry in a tabular form.

“ I am delighted with your ground plan of Natural History, for such I call it, as it includes the principles which serve as a guide to many branches as well as Chymistry. I have never before met with a plan so compendious, and yet systematical. It would indeed be impossible to remain in ignorance when knowledge steals upon us with so much clearness and elegance, as it surely does while flowing from your pen.

“ The easy style in which you communicate wisdom has tempted me to plunge into an abyss, which, while every step is delightful, furnishes me with melancholy reflections; how circumscribed is the utmost research of finite beings; how slow and uncertain are the most subtle reasoners; and how doubtful is the most plausible hypothesis. How then can I, who have been all ignorance and credulity until you opened my mind to a better comprehension of things, how can I ever hope to be able to walk alone in these labyrinths; but when I read over your instructions, they so far surpass any others I meet with

in clearness and elegant language, that I despair of gaining much light from the authors you recommend."

And, subsequently, after having made an extraordinary proficiency;—

"I am at a loss to find words to express my obligation* for your kind attention, in the friendly zeal you have shown in adding to my happiness by giving me the little scientific knowledge I possess. Your own conscious feelings must be the highest reward a benevolent heart can know."

Whilst to correct an exuberant imagination, too prone to indulge in theory, in allusion to a particular suggestion, he thus remonstrates with his pupil:—

"The opinion that all matter was originally the same, and the differences now observable only caused by various modes of aggregation, may be plausible: that these modes of aggregation depend upon degrees of attraction, &c. but these are vague conjectures, founded upon loose analogies, and afford no proper basis for our reasoning; they are amusing and flattering to the ingenuity of man, but they are the bane of science. To Bacon, Boyle, and Newton we owe our emancipation from these monkish reveries, these scholastic shackles; and since truth and nature have been pointed out by them, how

* It might be supposed from the similarity of expressions, that this passage was from the same correspondent cited a few pages back; but it is not so, nor were the writers acquainted with each other.

bright the career, how wonderful the progress of knowledge!

"But our business is to make plain the road to real science; not to enlarge on idle hypotheses, or visionary speculations.

"Chymical philosophy, for instance, teaches the *particular** properties of inanimate bodies; to induce them where they are not, and to destroy them where they are. He who knows most of these properties; who best understands how to induce or destroy them; and who reasons most correctly and most acutely from these facts, is the best chymist. But these facts are so numerous that it becomes expedient for the relief of the memory, and for the advantage of comparative reasoning, to arrange them in some systematic order. This method cannot be a perfect one; our ignorance is too great to allow of such; the method must be improved as our knowledge of the science advances."

Such has been the extensive revolution in this department since the sketch here alluded to was formed, that it would scarcely now answer the object for which it was so ingeniously contrived.

The hours which Dr. Withering generally appropriated to his correspondents were stolen from the night; and, though the accumulating heap of unanswered letters often appeared formidable, no one could charge him with indolence or inattention.

* In contradistinction to mechanical philosophy, which treats of the *general* properties of bodies.

For works of fiction, especially novels and romances, he never felt any partiality; even where the sentiments were neither licentious nor immoral, he deprecated their tendency, by "outstepping the modesty of nature" to excite a morbid sensibility, and to inflame the passions; thus inducing disappointment and mortification in real life. He greatly preferred, as a substitute for such productions, authentic histories or travels.

At Edgbaston, whenever possible, would our philosopher indulge in retirement. There, escaped from the toil and tumult of the town, in the most sequestered spots would he, in no unpleasant musing,

"Find tongues in trees, books in the running stream,
Sermons in stones, and good in every thing."

or, launching upon the unruffled surface of the lake, devote a summer's evening to angling, the "contemplative man's recreation;" whilst the swan,

----- "with arched neck,
Between her white wings mantling, proudly row'd
Her state, with oary feet."

At other times, attended by his faithful New-

foundland dogs,* he would inspect his beautiful herd of French cattle, selected for the dairy. Nor did he fail to derive amusement from the rookery; either in early spring observing the sagacious habits of the interesting colony, or later, when necessary, reducing the too numerous progeny.

He was not only a philanthropist, but sensible to every object both of the animate and inanimate creation: as the latter did not escape his examination, so, in the former, he discovered talents and endowments more or less companionable.

* However trite may be anecdotes of dogs, the reader will pardon the insertion of one or two respecting those in which the subject of this Memoir delighted. Not to dwell upon the unbidden scrutiny of every corner about his premises, which was invariably made each evening at dusk, (and, in these rounds, even the shrubberies were searched with prying eagerness;) Neptune was attached to a beautiful spaniel, which died in whelp. On this occasion, the brute testified his fidelity in a manner which would not have disgraced a rational being:—for many days, he lay over the spot where his favourite was buried, pining with grief; he would scarcely suffer himself to be interrupted to take food; became extremely reduced in strength and spirits; nor did he ever entirely recover his wonted powers and vivacity.

This same noble animal had been much caressed by a young person who usually visited his master's house on Sundays only. Whether apprized by the sound of distant bells, or by any domestic proceedings peculiar to the day, sure as that morning arrived, before the hour of breakfast, would he station himself on the drive within view of the entrance-gate, and there patiently await the approach of his expected friend, who was certain to encounter a joyful, though rather boisterous welcome.

Without forgetting that "the proper study of mankind is man," the generous horse was admitted to familiarity; puss participated his caresses; nor was the diverting monkey excluded from his fire-side.

His observations on the canine race were principally directed to the important subject of *Hydrophobia*. His opinions are in themselves novel, and, though involving a medical question, may, nevertheless, be admitted here, as of general interest; and delivered in his own words in a popular form.

"The subject of *mad dogs* has, for many years, occupied much of my attention, but I have still many doubts and difficulties before me. The chief positive knowledge which I have gained is a full conviction, that *all the prevailing notions about the disease are erroneous; and all internal remedies to prevent infection of no effect.*

"I believe there are two different diseases in dogs which go under the name of *Hydrophobia*; the one they certainly can communicate to their own species, but I am certain they cannot communicate it to man; nor am I perfectly convinced that they can infect other quadrupeds: this is much the more common disease. I have attended to its progress in dogs, and dissected them after death. They cannot swallow, because they have a sore throat; they will snap and bite; but they are neither insensible, nor any thing like what ought to be called mad.

"The other disease, which is extremely rare,

may certainly be communicated to man. This I have not seen in dogs; but in the human creature I have often witnessed its dreadful effects, and watched its fatal event. But even here there is nothing like madness, not even delirium. The spirits are much agitated, the patients easily alarmed, but perfectly rational, and without the least disposition to injure themselves or others. The agitation of spirits is more owing to the conduct of the attendants than to the disease itself; and even the *dread of water*, which has given a learned name to the disease, is no part of its symptoms. A desire to drink sometimes exists in the patient, but more frequently he is urged to do it. He cannot drink; the attempt brings on horrid spasms; and, at length, a repetition of these induces a dread of further attempts to swallow liquids.

“No preventive medicine hitherto used has the least effect in hindering the progress of the infection: nor is this singular; it is exactly the same with all other infectious diseases. The remedies so much relied on at different periods support a character for a time, but at length their inefficacy appears, and then they give way to another.

“The persons bitten by dogs under the first disease are very numerous; under the latter very few. All the former escape, and the credit of the medicine becomes established for a while. This, however, is not an innocent deception; a reliance on such medicines too generally diverts

the attention from *the only true mode of obviating the effects of the poison.*

“Cutting out the part has been often advised, and not unfrequently practised; but it is not every part that can be cut out, nor every patient that will submit to the operation.

“A simple but *assiduous washing* of the part bitten; first with cold, and afterwards with warm water, is, I am persuaded, *an effectual cure.*

“But it is not a slight, or careless washing that should be trusted; and, if the teeth of the dog have made holes, these holes should be washed with a syringe, the blood and *sanies* forcibly exhausted by means which are easily devised, and then filled with some kind of caustic.

“I have reason to believe that the neglect of a few hours is not sufficient to counteract the efficacy of these simple means.

“I would always destroy a dog suspected to be bitten; nor would I spare a cat; but leave horses and cows to their fate, only using the washings and the caustic, (soap maker's lye for instance,) wherever there may be the least appearance of a razure, or wound.

“The idea of *two sorts of disease* in dogs, I expect, has not gone further than to those who have heard me speak upon the subject.

“Dr. Haygarth,* of Chester, a few years ago

* Dr. Haygarth's directions, corroborative of Dr. Withering's observations, being explicit, and now probably in the possession of few, are printed in the sequel. *Vide Appendix, No. XX.*

took much pains to spread the knowledge of the simple and efficacious preventive which I have mentioned, and I also took a share in the business. But these things are soon forgotten, when no one is particularly interested in enforcing them: possibly too, a remedy so simple and so easy, might not gain the confidence of the multitude."

Of the species of monkeys inhabiting the rock of Gibraltar, Dr. Withering domesticated two, with a view to become acquainted with their peculiar characteristics; in regard to which he states:—

"The judgement I formed was, that what is called a mischievous disposition does not exist in them naturally, but is the effect of fear in most cases, and of bad education in others. They possess more intelligence than any animal except man, and much resemble him in a state of childhood, both as to his improvidence and his tyrannical disposition; but without the means of further improvement, and are totally destitute of gratitude and good manners; so that, superior to the dog in intellect, they are not so good companions for man. I could have wished to have ascertained a few more points concerning them, but the experiment in this climate is too cruel; it is as bad as sending the West Indian to perish in the colds of Canada."

One of these amusing animals died of consumption, after suffering from cough and hectic symptoms two or three winters, during which the poor creature could scarcely be kept from shivering even in the chimney corner, and subsisted

chiefly on oranges and other fruit, till wasted to a skeleton. The lungs exhibited appearances similar to those of the human victim of *Phthisis pulmonalis*.

Many were the ingenious devices of these entertaining little beings ; not unfrequently evincing a surprizing degree of forethought;* yet affording no indication whatever that could justify the whimsical fancy that the most cunningly-sagacious of apes, baboons, or monkeys, of all the tribe of *Simiæ*, with or without tails, were in gradation allied to man himself!

Professor Camper, by his dissection of monkeys, particularly of the orang-outang, demonstrates that they are “ *prevented speaking* by certain *aerial follicles*,” which are general in that race of beings,—a singular and little known fact.

“ Nor is it unworthy of notice,” observes a sensible writer, “ that the animal which has the greatest resemblance to the intelligent and powerful lord of this globe, in appearance and external habit has few of the virtues with which he is endowed ; whereas the elephant, which resembles

* One instance may be related in illustration. Cockchafers, (*Scarabæus melolontha*) were a high *bonne bouche* to Jackoo. A large collection of them was placed before him ; but whilst engaged in greedily devouring a few, many quickly fled or crept away. To prevent the loss of these dainties the monkey suddenly changed his plan, and before proceeding in the enjoyment of the feast, carefully decapitated the remaining insects, (thus effectually preventing their escape,) and afterwards indulged his appetite at leisure!

him less than every other animal in size, shape, and beauty, comes the nearest to him in great abilities and in every human virtue. Is not this meant to show that our intellectual and moral powers are not the effects of matter, nor of its arrangements?"

To the preceding remarks may be added a *jeu d'esprit*, which, though in itself trifling, will serve to prove that, in moments of relaxation, Dr. Withering was not averse from indulging in pleasantry.

An American lady, resident in England, having sent a present of nuts to the favourite monkey, the mimic animal, at the instigation of his protector, is supposed to offer the following acknowledgment in characters written backwards.

"To the fair daughter of the western sky, poor Jackoo sendeth, greeting:

"Know, thou most admirable of the children of men, that when the mighty Parent of the Sun debarred my species of the faculty of speech, he did not altogether withhold the knowledge of language; but, above all, he endowed us with a sense of gratitude to our benefactors.

"It is from this impulse, O bright-eyed excellence! that I now address thee; presuming that thou wilt not take offence at a motive which is so plenteously interwoven in thy own nature.

"I rejoiced at the sight of thy nuts, from the world in the west; but alas! the Jackoo tribes, accustomed to the richer fruits and milder kernels of vertical meridian suns, can ill digest the crude

unfinished products of its evening rays. Oh Africa! how do I sigh for thy groves of palms, thy spicy breezes, and eternal summers. My heart is too full to allow of further utterance.

“Farewell! thou daughter of the western world:—whether thou treadest the verdant plains of Britain, or wanderest through the luxuriant savannahs of the west, may peace and pleasure attend upon thy footsteps; and, when thy abode on earth shall terminate, may the mighty Maker of the Sun receive thee to the brightness of his presence!

“So much from thy devoted slave, who will ever be proud to kiss the hem of thy garment,

“JACKOO.

“Not having yet attained the European mode of writing, thou must not wonder that, after the manner of my country, I write from right to left.”

Nor will the reader be displeased with the reply of the very ingenious correspondent of Jackoo; which, though extravagantly complimentary to his benefactor, bespeaks a warmth of sentiment no more than is consistent with the generous conduct of that long-tried friend.

“It far supasses my abilities, most excellent Jackoo! even to attempt an answer to thy elegant letter; but many an hour have I passed in admiring its beauty. During one of these agreeable reveries, sleep insensibly overpowered me, and produced a dream, inconsistent in itself, yet in some respects so analogous to my waking

thoughts, that I cannot withhold the communication of it.

" Methought I was standing in a spacious apartment, surrounded with books on every science, theology, philosophy, physics, rhetoric, &c. &c. On the carpet a monkey was gamboling, and playing a thousand antics, of which I took little heed, my whole attention being engrossed by a person who sat writing at a table in one corner of the room. His side being towards me gave an opportunity of surveying his countenance unobserved, in which benignity, quickness of apprehension, and wisdom, were so happily blended, that I should never have ceased gazing, had not Jackoo roused me by repeatedly beckoning me towards him. I at last followed to a convenient distance from the sage; but guess my astonishment when I discovered my little companion was endowed with the faculty of speech. It could only be exceeded by my joy, when he told me he read my thoughts, and was able and willing to gratify my curiosity respecting the stranger.

" You may here, said he, contemplate Philosophy in its most enchanting guise; soaring to, and comprehending, objects most sublime; yet, with graceful ease, descending to notice the most familiar; with a mind uninctured by austerity, he happily unites the whole system, theoretical and practical: but no wonder he should have attained such excellence, since it has been his favourite study upwards of three thousand years.

" I could not here repress a smile at the sup-

posed error in the chronology of my little intelligencer, which I attributed to his not being much versed in the calculation of dates, but he quickly perceived it, and informed me he had not exaggerated.

“How is that possible, cried I; the age you mention trebles even the most remarkable instance of antediluvian longevity.

“It does so, said he; but you cannot suppose that I mean to assert his soul has, during that period, animated only one body. Various have been the transmigrations; indeed far too numerous for my treacherous memory to recount. The most singular event I recollect, is, that of his body having been destroyed by thunder, for restoring Hippolytus to life. The art by which he was enabled to do so, he, in a degree, still retains.* He was long after this among the number of pupils who attended the school of Pythagoras, at Crotona; to him are we indebted for the traditional precepts of that good man, (who never committed any thing to writing). He also adopted the humility, together with the opinions and practice of his master, that ‘*To speak truth, and to do good to others, is to resemble the Gods.*’ In short, through every transmutation, he has carefully preserved the virtues acquired in each.

* The reader will here be struck with the elegantly complimentary and strictly classical allusion to the fate of Æsculapius, and the doctrines of the *Sophist*.

"Happy Jackoo! exclaimed I, how enviable is thy station, thus to be permitted ever to attend on the steps of such a master; a witness to his extensive acts of benevolence; and equally admirable, though less dazzling, performance of every private duty. If there be ought of reality in the doctrine of a metempsychosis, oh! may it be allotted me to fill thy post. With what delight should I exert myself to amuse and relax his mind, when wearied with scientific and abstruse researches.

"Whilst I was uttering this exclamation, and animated only by the interest which every good and great character inspires, the philosopher arose from his seat, and accidentally turning towards me, I discovered him to be my well known friend, equally loved, esteemed, and venerated.

"My desire of succeeding to the employment of my little companion now became more powerful than ever. The zeal with which I resolved to evince my attachment and gratitude, excited such strong emotions that it broke the bands of sleep, and I awakened with clasped hands, and my mind in a fit disposition for invocation; I therefore addressed the Throne of Grace, for every temporal good to my friend, but still more fervently for eternal blessings in the realms of bliss, where those who enter can wish for no change or migration.

"Farewell Jackoo! Accept, with thy own peculiar grace, and a pleasure equal to that ex-

perienced in making it, the *cap* which accompanies this; and wear it for the sake of

“C——— S———.”

Such were the strains of eulogium, direct or indirect, which the character of Dr. Withering drew forth: not from individuals who had no sufficient opportunities of remarking his conduct, nor from servile flatterers, but from those who were intimately acquainted with every excellence, and with each defect; and whose opinions could only be influenced by the qualifications which they themselves observed.

If any, on perusing this sketch, should, from ignorance of the original, imagine it to be overcharged on the favourable side; let it be remembered that the testimonials here cited are the unpremeditated effusions of comparatively indifferent persons.

In tracing the temper and dispositions of the mind, as in delineating a personal resemblance, it is natural to prefer the most favourable likeness of which truth will admit. To blazon and magnify imperfections, to which every human being, both mentally and corporeally, must be more or less subject, were but an ungracious task. The amiable soul will dwell with more complacency

on what is praise-worthy in a fellow creature.
But

“ Envy pursues true merit as its shadow,”

and detraction is ever ready to assail superior desert. Neither did Dr. Withering, altogether, escape the insidious attacks of calumniators in his own profession. On one of these, happily, rare occurrences, wherein he had been timely warned by a faithful friend, he replies in the calm spirit of integrity:—

“ The charges are so general that I know not how to answer them ; and unless I hear further, and more explicitly, I shall scarcely take the trouble to notice them. There is a certain confidential composure, founded upon the conscious rectitude of our own actions, which renders a man invulnerable to the attacks of ignorance or the shafts of slander. Truth will ultimately prevail, when the flying reports of the day shall be forgotten ; but lest you should think me presumptuously secure, I shall explain to friendship what I would not do on my own account to the world at large.”

And when, on the imputation becoming somewhat more palpable, he found that though, as he states, “ he might for a while be distressed by cunning, or harassed by intrigue ; he feared not to meet his adversary on any ground, convinced that the ‘ *mens sibi conscia recti* ’ could never be overthrown.”

By an undisguised and direct course did he baffle and expose the wiles of his opponent, fully establishing his own just pretensions.

Thus sedulously did he guard the fair fame which had been conferred upon him. But even his professional celebrity, important as it was to himself and to his family, was never watched with that vigilance which he unremittingly bestowed on moral reputation. Of that good report,

“ So hard to gain, so easy to be lost,”

as the basis of true respectability, he was scrupulously tenacious. More cruelly, therefore, were his feelings wounded, on discovering that the man whom he had fostered and patronized almost from childhood, should be guilty of ingratitude, charging him with conduct at once dishonourable and dishonest. Most reluctant was he to entertain a suspicion of the injurious treatment he was about to receive. To detect a misplaced confidence; to encounter the malevolence of bitter enmity, instead of an amicable co-operation; an unnatural jealousy nurtured by exorbitant expectations, and a mortified pride; could not but excite the most painful surprise.

In this case the claims preferred, unreasonable as unexpected, were submitted to the arbitration of an honourable person, actually nominated by, and an acquaintance of, the hostile party, though totally unknown, except by character, to Dr. Withering. If there be the smallest

doubt remaining of the equity of the Doctor's intentions and proceedings, the opinion here presented must silence every such insinuation.

This gentleman, (after having effected a positive arrangement, to which both parties acceded by signing an agreement, but which was speedily frustrated by the inconsistency of his own friend,) furnishes the following handsome acquittal in a letter still extant:—

*From T—— F—— H——, Esq. to
Dr. WITHERING.*

“ Sir,

“ I have felt your candour and liberality both of principle and conduct, and I am certain that —— can only have to complain of himself hereafter; so strongly have you convinced me of your open and noble principles of action.

“ I flattered myself, at one time, that this transaction would in every sense have given me satisfaction: ——'s conduct in the conclusion has certainly rendered it unpleasant. I am, however, indebted to it for the pleasure of being able to assure you, and I hope not for the last time, how sincerely I am

“ Your friend and servant,

“ T—— F—— H——.”

“ Self-vindication,” observes the Doctor to a correspondent, “ is an awkward business, even under the most favourable circumstances; but it

fortunately is now in my power to justify my conduct by the evidence of a third person, and that person the particular friend of my opponent. I do not trouble you about this matter merely for the sake of vindication; but I wish my proceedings and intentions to be known, in order that they may either challenge the approbation, or excite the correction, of men of sense and character."

It is scarcely necessary to add that he met with deserved support under so unmerited an aspersion. With these few exceptions, in which he gained the advantage by rebutting falsehood and chicanery with truth and plain dealing, he was enabled to preserve the tenor of his way in undisturbed tranquillity. Never was an individual more cautious of giving real ground of offence, or of a less litigious disposition.

1789.—On the 3d of July, Dr. Withering paid the last melancholy duty to his dying parent, who, though full of years, had continued to occupy her station in society, and to enjoy the respect of all around her, till within a few preceding days. "She rejoiced," wrote her son, "in her approaching dissolution: those who knew and admired her virtues lamented it."

He rather desired that his children should witness, than be withheld from the solemn scene,

where no erroneous impressions were permitted to arise. He wished to remove the superstitious dread of death, before it could have taken full possession of their minds, and thus early to accustom them to contemplate the awful change, to which it becomes the precarious sons of mortality to be reconciled. To produce such an effect the event was well calculated. Her end was peaceful and serene, deeply impressive of the highest sentiments :

“ Heaven - - - - - owns her friends
On this side death; and points them out to men :
A lecture, silent, but of sovereign power !”

1790.—In the spring the Doctor suffered severely from peripneumony, and the cold winds of March and April retarded convalescence.

In some respects this might be considered a mild winter, the thermometer never having been lower than twenty-six degrees,* and that only on two nights, and the little snow that fell not lying twenty-four hours; yet, as if to compensate for such unusual clemency, it is remarkable, according to Dr. Withering, that “ on the 22d of June, the accumulated violence seemed to

* The thermometrical observations mentioned in the course of this narrative, are according to the scale of Fahrenheit, taken out of doors, and in the shade; those by an instrument exposed to the solar rays, being comparatively useless.

spend itself in an extended storm of thunder and lightning, which came from the south about seven o'clock in the evening, and continued nearly four hours, accompanied with such a quantity of hail as to cover the ground to the depth of four or five inches in a few minutes, at a place called the World's End, near Solihull, in Warwickshire. The hail-stones measured two and a half inches in circumference.

“ On the next morning, in places where they had rebounded from the walls of the house, they still lay to the depth of five inches. All the windows on one side were broken; the currant and gooseberry trees stripped of their branches, and the cabbages cut down, only the stems of the former, and the stalks of the latter, remaining; fifteen acres of barley were destroyed, and the heads cut off a field of wheat. The extent of the storm in breadth was less than a mile; the thermometer at two o'clock P.M. in the shade, indicated seventy-nine degrees and thirty minutes.”

In the Transactions of the Royal Society for this year, we find inserted his “*Account of some extraordinary Effects of Lightning.*” The first statement details the destruction of a house at Sutton-Coldfield, on the 24th of June, 1787, by a thunder-storm which had previously set on fire a house on Birmingham Heath, about seven miles distant from the former place.

On considering the particulars the Doctor observes, “this case seems to speak strongly in favour of metallic conductors; there being, perhaps,

scarcely an instance upon record of so much damage having been done by a single stroke of lightning; and I believe it would not be easy to find a house more completely destitute of good conductors; for, except the lead in the windows, and the strips of lead over the door, I could discover none. Neither was there any thing in the situation of the house likely to invite the stroke; for it stands on dry ground, on the descent of a hill, with no water near it, except a small puddle occasioned by the waste water from the house.

“ Let me add, also, that the church stands at a small distance considerably higher upon the hill : that the cloud necessarily passed over the church before it approached the house, and that the former escaped unhurt, though the latter suffered so much.

“ The common opinion that the cellar is the safest place in a house during a thunder-storm, receives confirmation from the safety of the inhabitants in this ; but another vulgar opinion, that malt liquor is changed by thunder, does not appear to be true; for the malt liquor in this instance suffered no change, though many housekeepers are so persuaded of the fact that they put smoothing irons upon, and bars of iron against, the casks, by way of prevention. Probably the change attributed to the thunder, may be caused by the sudden changes in the temperature of the atmosphere, which are so frequently experienced before, and after, thunder-storms.”

The other part refers to lightning, which, in the month of September, 1789, struck an oak

tree in the Earl of Aylesford's park, at Packington, under which a peasant, who had imprudently sought shelter, was instantaneously killed.

A perforation was made by the electric fluid, about five inches deep, through the spot where his walking stick rested on the ground. Under this, in digging the foundation for a cautionary monument, which has since been erected, the soil became blackened to the depth of about ten inches, and two inches still lower, a quantity of *melted Quartzose matter* began to appear, continuing in a sloping position to the extent of eighteen inches beneath.

Specimens of this uncommon production were deposited in the museum of the Royal Society. The extremely hard mineral, Quartz, has rarely been discovered in a state of fusion. A vitrified substance of a similar nature was found by Dr. Withering on the shore of the Tagus, near Lisbon, obviously the outcast of a neighbouring crater.

Towards midsummer he was capable of labouring indefatigably to perfect the remainder of his botanical work. "He could not have allowed," as he states, "the first part to have been longer delayed than it was, without manifest inconvenience to younger botanists, who could scarcely have comprehended the system without the introductory key, and who, in the first instance, were not likely to feel the want of the Cryptogamia class."

1791.—In the following year the same trying season brought with it renewed suffering to the invalide. When within a few days only of concluding his “*Methodus Nova Fungorum*,” (which had been gradually formed from an attentive examination of species made without reference to any system, and drawn up on a review of the whole subject,) on the 18th of May, a sudden peripneumonic seizure supervened, and for nearly a month prevented his writing even a single letter.

This relapse was attributable to very close application for the three preceding months; which often, particularly during the latter part of that time, induced an oppressive sensation in the chest, only to be removed by rising and walking about for some minutes.

Henceforward his existence became an arduous struggle against the inroads of disease; but his mind, still impelled by the noble sentiment,

“ Whilt I yet live, let me not live in vain,”

ceased not to retain an energy which enabled him to persevere in active duties.

In pursuance of the elucidation intended, Dr. Withering's ideas respecting the different modes of education may be here briefly noticed.

His opinion was not altogether favourable to the larger institutions; indeed he ventured to pronounce the broad censure, that, "if parents would bring up their children for this world, they should send them to public schools; if for the next, give them a more private education."

Although he undoubtedly intended such an expression to be interpreted in a qualified sense, he was painfully aware of the prevalent relaxation of morals in some of the more numerous seminaries, tending to sully the ingenuousness of youth, and to endanger the future character of the man.

He likewise presumed to believe that, in such situations, the means were frequently mistaken for the end; and an ostentatious display of classical learning held up as the *ultimatum* of useful knowledge; to the neglect of those all-important principles which alone can insure the "*integer vitæ*."

"Weigh for a moment classical desert
Against an heart deprav'd and temper hurt;
Hurt, too, perhaps for life; for early wrong,
Done to the nobler part, affects it long."

His highly valued friend, Dr. Percival, seems to have entertained sentiments not dissimilar, when he describes public schools as "lotteries, furnishing some dazzling prizes, but attended with *general loss*."

To say nothing of the system of *fagging*, so productive of tyrants and slaves, is there not reason to apprehend that the moderate talents of the many, may be depressed by the strong excitement afforded to the more vigorous intellect of the few? Be that as it may, it stands asserted on respectable authority, that of the different modes of education which have produced the most distinguished characters in this country, the proportion, *according to relative numbers*, will be found in favour of more private tuition.

The question is, undoubtedly, momentous; not only as affecting individuals, but the community; inasmuch as the prosperity of a state greatly depends on the public and private virtues of its members.

With respect to the dead languages, Dr. Withering felt less desirous that the scholar should attain a critical, than an useful, practical acquaintance with them. He esteemed them merely as the *vehicles of knowledge*, not as *knowledge itself*; and often deplored the fashionable folly of tutors inducing their scholars thus to rest contented, as it were, *in limine*. He judged it sufficient for the generality of young men to possess a tolerable facility in writing Latin, and in reading Greek; for which end he recommended the prose writers rather than the poets: in the Latin style, aiming at a natural and easy simplicity, in preference to an obscure or poetical phraseology.

To those intended for the Medical profession, he advised the study of Celsus, as a pattern on such subjects; and of Ray, as equally so in Natural History. He considered the "anatomical knowledge requisite for a physician, and a surgeon, as two distinct things; the former not standing in need of a minute myology or osteology, or of being able to trace every subordinate ramification of a nerve or an artery; but that he should be most intimately acquainted with the size, situation, and structure of the *viscera*, and be well informed of the course of the lymphatic absorbents."

To his son, whilst at the University, he would occasionally suggest hints of advice, particularly recommending caution and firmness in abstaining from the use of strong liquors. "Solicitation," he observes, "is soon overcome when uniformly found to be fruitless. You never have had any counsel for which you will have reason to thank me so much, as that on the present subject. Those who have been only a few years in medical practice become aware, that by far the greater number of diseases which imbitter and cut short our existence, are the effect of intemperance in strong liquors; nor does there seem much difference in the choice of them. The ale-bibber fancies himself safe with what he calls sound, wholesome, and perhaps home-brewed ale; the friend to generous port pities the drinker of punch and spirits; and thus men cajole and deceive them-

selves, lamenting the folly of others, insensible to their own.

“You will have many more such trials to contend with; but you can safely smile upon the contempt of the few, because they will either turn out worthless, or their contempt will ere long be changed into admiration, if not into a regret that they have acted otherwise. They will eventually esteem you the more.”

In regard to food also, he was fully convinced, that simplicity materially conduces to health. “Eat what you like of one kind of meat, but do not indulge in variety,”—was his golden rule in dietetics. This aphorism he reiterated upon all proper occasions, to warn the unwary against the numerous train of ills induced by yielding to such temptation.

The superintendence of his daughter's education, was for some years intrusted to a confidential friend; and, from the few letters which were addressed to her during that period of absence, may be selected the following, as descriptive of domestic habits, and evincing that practical good sense which pervaded the Doctor's writings.

May 1, 1791.

“My dear girl,

“Your request to obtain a letter from me has not passed unregarded; but the execution of it

was necessarily postponed until a leisure hour should present itself. But when was that to be expected, seeing that every moment had long since been devoted to the completion of my botanical work. Let this consideration, therefore, console you for the long delay; that, though I have not yet written immediately to you, I have been writing for you, and many others, to whom I hope that work will prove a source of useful information and elegant rational amusement.

Your brother pursues his inquiries in the vegetable tribes; but, as we now do this in the Latin language, his progress is not so rapid as heretofore; and I expect you will overtake him next summer, when you may travel this delightful road together, and occasionally experience mutual assistance when difficulties occur. The little parlour is filled with a large table, and the necessary books placed on benches around the room. Thither I retire every day after dinner, and again after supper, and by this close application hope to finish about Midsummer next.

"A letter from a father to a daughter is, I believe, usually filled with such advice and such admonitions, as are the result of the greater experience of the former, adapted to remove, or to guard against, the faults or foibles of the latter; but your conduct admits of so little room for observations of that kind, that I am satisfied to leave you to the guidance of your own good sense, and the occasional assistance of our worthy friend, to whom I have entrusted the

formation of your manners, as well as the direction of your more important acquirements; confident that she will impress on your mind the most sacred regard to *truth*, to that *accuracy of truth* I mean, which, in trivial matters, is so often violated by the rapidity of the female imagination: that she will inspire you with courage nobly to acknowledge an error when inadvertently fallen into; and that she will teach you to check, and restrain within useful bounds, those little pettish resentments which are the natural excrescences of sensibility, and demand the restraints of reason to subdue them. I do not mean to eradicate them; every thing existing has its use; and the most amiable characters, as also the most worthy, are those which have the strongest passions, and the most lively imaginations, properly subjugated.

“ I present you with a few ‘Maxims of the Countess of Carlisle,’ but have drawn a pen over some towards the end, which want truth for their foundation, and are distorted by the medium of early prejudices. I met with this little work at Enville, and knowing the excellent example and unwearied assiduity by which that admirable mother* trains up her children, it occurred to me that the book might not be unacceptable to you. Some few of the maxims are applicable only to women in the highest ranks of society, but the majority of them are suited to general use.

* The Dowager Countess of Stamford.

"The verdure of the park is more vivid this spring than I have ever before seen it: the large cherry-trees are white with blossoms, and the chestnuts are protruding their gaudy spikes; the cuckoo has cleared his pipe, and the swallows now first appear. I look forward with pleasure to the time when you will be the companion of my walks, and the gay enlivener of my severer studies.

"Adieu! my dear Charlotte; and at all times console yourself, that you will ever find a friend and father in

"W. WITHERING."

In this happy country, where the press is unfettered, and where freedom of discussion prevails to an almost unlimited degree; where the meanest subject sensibly feels, and cheerfully acknowledges himself a member of the state; each individual assumes more or less of a political character. We now arrive at an epoch of such general interest as to call forth the unreserved sentiments of every one,—the memorable era of the French Revolution.

Enough, perhaps, has already fallen from the pen of the biographer, to enable the reader to infer, that Dr. Withering, as the advocate of civil and religious liberty, would embrace the popular side of the question. He had himself

smarted under despotism, and had tasted the sweets of genuine freedom: he had been eye-witness of the grievances by which the French nation was oppressed, and he had been apprized, so early as the year 1787, of the undoubted intention of their most enlightened statesmen, to endeavour to correct the abuses in the government.

“If M. de Calonne, the present excellent minister of France,” writes Dr. Withering, “can, by the assistance of the Notables, accomplish his intentions, he will prove himself as great as the greatest man that ever swayed the councils of an empire. He means to abolish all the internal duties, which have so long been a check to the improvement of the different provinces; to set aside the Farmers of the Customs, who have imbibed, like sponges, the sweat of the public brow; to render useless the assistance of twenty-five thousand Excisemen; and, lastly, to grant a free toleration to every denomination of Protestants, without excluding them from places of honour and profit.”

Such seem to have been the benevolent designs of some of the leading men; but, unhappily, the seeds of corruption were too generally diffused over that devoted land, to admit of the proposed amelioration. Torn by factions of unprincipled citizens, it was alike dangerous to advance or to remain stationary. Dissatisfaction had reached its acmè; confidence between the governors and the governed was lost; the situation of affairs

had become desperate: the elements of regeneration no longer existed.

The destruction of the Bastille, that opprobrium of France, though the result of an alarming popular tumult, was yet hailed as a favourable omen, and in the language of our animated poet,

“There’s not an English heart that did not leap
To hear that ye were fall’n at last; to know
That ev’n our enemies, so oft employ’d
In forging chains for us, themselves were free.”

But the ferment was too extensive to be restrained within any bounds; there was no reaction; no sufficient spring of public or private virtue remaining; the root of the evil was deep-seated, and its baneful influence had long been ramifying through each class of society. No one deprecated more feelingly than did the subject of this Memoir, the defect which was daily becoming more apparent. The atheistical tenets of Diderot, d’Alembert, and Voltaire, had introduced an absolute contempt of all religion; which had been encouraged, rather than discountenanced, by injudicious rulers. The social compact once dissolved, the sequel could not but be anarchy and rapine, with their attendant horrors.

Thus prepared to throw off the restraint of moral obligation, the attempt to favour American independence recoiled on our great rival. Vari-

blasted : he lamented, with his friend Dr. Currie, that though, "in the dawn of that beautiful morning, the genius of French freedom appeared on our southern horizon with the countenance of an angel, she should have so speedily assumed the features of a demon, and vanished in a shower of blood."

Whilst the infatuated Parisians were paying their vows at the shrine of the Goddess of Reason, with a fanaticism worthy of the darker ages, the flames of civil discord burst forth at home, and scenes but too analogous were acting in the centre of England.

In the month of July, 1791, the peace of the town and neighbourhood of Birmingham was for many days disturbed by an infuriate and deluded mob. After a dinner in commemoration of the French Revolution, which had been attended by about eighty gentlemen, who dispersed as early as six o'clock ; in consequence of an unusual and threatening assemblage of the populace, the Meeting-Houses of a respectable sect of Dissenters were destroyed ; and in a short time several very capital mansions fell a sacrifice to the idolatry of "Church and King," sacred names, disgraced by being connected with such transactions.

The proscribed list was enlarged with the success of each enterprize of demolition, not only comprehending families of the obnoxious denomination, (far more distinguished for their munificence than for virulence of party-spirit,)

but all who dared to think liberally concerning them. Unjust suspicions were entertained, and malignant reports industriously propagated, to sustain the spirit of Vandalism, till the primary object seemed to be forgotten in a savage thirst for plunder amongst the numerous and increasing bands of rioters. Then, indeed, all became dismay and terror; principles and opinions were no longer consulted; wherever was valuable property, there was the storm of devastation indiscriminately directed.

It might have been supposed that Dr. Withering, an attendant on the Established Church, cautiously avoiding political interference, and no partaker of the public dinner, would have remained unmolested: but the dregs of the people, abandoned to the wildest passions, and inebriated with strong liquors, hesitated not to attack his residence: and after having been repulsed in three separate attempts to obtain forcible entrance, threatened to destroy his property in the town. To his honour be it recorded, that, as became a man of tolerant and truly Catholic principles, he had patronized the benevolent institutions of the more liberal Dissenters; considering difference of opinion in modes of faith as inevitable, and no just ground for uncharitable feelings.

So, on this urgent occasion, he had the courage to receive into his own house a fugitive and persecuted family, affording them an asylum, till he was himself, (in an exceedingly critical state of

health,) forced to abandon his premises, and hastily to secrete, or convey away, the more valuable effects. From this sudden removal his books and collections in Natural History, (driven in waggons, covered with hay, through the roughest and least frequented lanes, to elude the pursuit of the many-headed monster,) sustained material injury.

It must be acknowledged with grateful remembrance by the writer, that, notwithstanding the general consternation, many of the Doctor's neighbours afforded the most zealous proofs of attachment, by rallying round him in the hour of danger. Several gentlemen risked their lives in resolute exertions to discomfit the incendiaries. This resistance retarded the catastrophe; but no sooner was one party repelled, or persuaded to desist, than others came forward with renewed violence; and nothing but the arrival of a military force at the particular juncture, could have rescued the extensive edifice from being reduced to ashes: a fate it had experienced a century before by an equally insensate multitude. "Oh, Religion, thou heavenly gift! to what strange purposes do the demons of earth devote thee!" was the reflection of Dr. Withering, whilst submitting to these unmerited outrages: and he adds, "But no risk of reputation or judgement ever did, or ever shall, deter me from doing what I believe to be right; for, that done, self-approbation follows, which is sufficient to support us under any consequences whatever."

Exclusive of the personal inconvenience experienced by himself and family, one hundred and fifty pounds might have repaid the calculable loss occasioned by these depredators; for which, however, he declined preferring any claim against the Hundred, (as was done by the more severe sufferers, to the amount of nearly fifty thousand pounds;) but nothing could compensate the mischief done to articles which could not be subjected to pecuniary estimates.

Posterity will scarcely believe, that in a country where the whole community is equally under the protection of the laws, and where every man is, as it were, constitutionally bound for the good behaviour of his neighbour, acts so atrocious should not have been effectually repressed at their commencement.

It would be difficult, even after the lapse of so many years, for an eye-witness of those destructive conflagrations, to enter dispassionately into a retrospect of events, which must sully the page of British history. Rather let us consign to oblivion recollections little calculated to promote harmony, or to re-establish mutual confidence. Whatever might have been the exciting cause which gendered so much animosity, and led to such calamitous consequences, it must ever be regretted that no proper measures were timely adopted by the local authorities, to arrest proceedings which will be held in lasting reprobation.

Before the termination of the year 1791, Dr. Withering was elected a Fellow of the Linnean Society, though with little prospect of being able to contribute to the learned researches of that body. His life was now gliding away not as "the gentle shadow of the sun-dial whose motion we do not see," but with the more perceptible decay of ravaging disease. The odious spirit of party, which had reared its factious crest to the interruption of social intercourse, could not but prove painful to him; and before the general irritation could subside, the inclement season commenced, increasing the demand for his attendance on the sick, when least able to perform such duties.

The treatment of his own disorder, by which his existence was, year after year, almost miraculously prolonged, was probably the most extraordinary effort of his medical skill.

1792.—The difficulty of restricting professional engagements being insurmountable, Dr. Withering began to entertain serious thoughts of retiring to a warmer climate. After having dedicated a portion of his time to the public institutions for the relief of the indigent for more than five-and-twenty years, it was not without regret that he resigned an office which had always proved mutually satisfactory; but this necessity neither diminished the interest he took in such

establishments, nor the desire of serving them on any particular occasion.

The *third volume* of the second edition of the "*Arrangement*," now appeared with a considerable accession to the Cryptogamia class, a department which, not falling under the system of the Swedish naturalist, had been to him little attractive. The novel distribution of the obscure tribes of *Fungi*,* which rendered their investigation as easy as that of the more perfect plants, was peculiarly the author's own.

This system was admitted by the reviewers to be, "the most instructive and complete yet published, entitling its author to the warmest thanks of all English botanists." Similar approvals were also received from other quarters. "It is indeed," writes Sir J. E. Smith, "an elaborate and skilful work. I am glad you have taken so much pains with the *Fungi*, which nobody has well explained before." Whilst the Rev. R. Relhan, author of the "*Flora Cantabrigiensis*," observes, "I assure you, without flattery, that you have done more than I ever expected to see executed with respect to the *Fungi*, and I think botanists in foreign countries would be much delighted with the excellency of your system." Dr. Pulteney

* The ancient pasturage and plantations of Edgbaston were particularly favourable to these fugacious productions, and having, by a series of chymical experiments, (vid. Trans. Linn. Soc. vol. ii.) devised a mode of preserving them in such perfection as to admit of examination and comparison, he was enabled to characterize them more accurately than had before been done.

adds, "This must indeed have been a laborious work, and the pains you have taken with the Agarics will ensure you a lasting reputation, and the thanks of all future botanists."

Dr. Withering's debility increasing rather rapidly, bespoke the necessity of some immediate change. It had been his intention to have wintered in the south of France, but the distracted state of that country rendered it impracticable. He, therefore, resolved to travel towards the west of England, preparatory to embarkation for Lisbon, a station to which many families had latterly resorted from the same cause. Such an expedition, in itself formidable to a suffering invalide, was aggravated by the certainty of war. Mrs. Withering and the Doctor's sister,* prepared to accompany him as far as Cornwall, whilst his daughter, with Mr. and Mrs. Pearson and family, were destined to proceed to a more southern latitude.

On the 15th of September, 1792, the travellers departed from Edgbaston. Sleeping only one night in the central part of Worcester, brought on the invalide such an oppression as a week's residence in the purer air of Malvern and Cheltenham, assisted by low diet and bleeding, scarcely removed. In

* A just character of Mrs. Sarah Withering may be read in the Magazines of 1814, wherein it is stated that "to a persevering discharge of humane and charitable duties, too deeply wounding those tender sympathies which eventually corrode the feeling mind, and raze the foundations of health, may be attributed that premature decay which terminated her valuable life."

the few rambles he was enabled to make about that picturesque neighbourhood, he collected some of the rarer plants, and made the following remarks on the structure of the mountain.

“ Malvern Hills consist of about fourteen different elevations, or rather one elevation with fourteen depressions. They run in a direction nearly north and south, the northernmost part of the chain being the highest. The Well-house and spring are on the east side, nearest to the southern end. On this side we gathered quartz, not granulated, in veins, granite, and rag-stone; but the chief bulk of the hill appears to be composed of coarse jasper, similar to that of which the Wrekin, in Shropshire, consists.”

The dense atmosphere of Bath compelled a speedy retreat; and the interesting curiosities of Clifton and the Hot-wells were passed with much mortification. With difficulty he reached Teignmouth, whose mild temperature, aided by sea breezes, and strict abstinence, abated the more urgent symptoms, and enabled him to advance to Falmouth. Though prevented availing himself of introductory letters, the attentions of Captain Brathwaite,* who most obligingly proffered every accommodation in his power, cannot be forgotten.

On the 24th of October the Doctor embarked on board the King George packet. Almost every vessel bound for the Tagus was inconveniently

* This gallant veteran had passed fifty-six years in the naval service, without having been either captured or shipwrecked.

crowded with valetudinarians, and, in the present instance, fifty-nine persons were stowed in a ship of about three hundred tons burden. The party were informed that the passage out averages ten days; homeward frequently doubles that time, from the strong opposing winds prevalent north of Cape Finisterre.

* "In twenty-four hours after having put to sea, the weather being hazy, thrushes and robins alighted in the rigging and on the decks, so exhausted from fatigue as to suffer themselves to be taken by the hand."

Porpoises,† impelling themselves above the surface of the water by a surprising effort of successive leaps, kept along-side the ship, seeming to claim a near affinity to their congener, the dolphin, so celebrated in the fabulous histories of the ancients:

"Upon the swelling waves the dolphins show
Their bending backs; then, swiftly darting, go,
And in a thousand wreaths their bodies throw."

SENEC. AGAM.

During the three first days, the King George sailed at a rapid rate; the waves breaking over the deck so as to prevent the enjoyment of fresh air. Many had already suffered severely from sea-sickness; but, by a peculiarity of constitu-

* The passages between inverted commas, inserted here and in the sequel, are extracted from Dr. Withering's memoranda.

† Or rather Porpesse, (*Delphinus Phocæna*,) as conjectured, from the Italian, *porco pesce*.

tion, Dr. Withering was, on all occasions, exempt from that inconvenience.

On the third day, at noon, the voyagers were off Cape Finisterre; having already traversed more than one hundred and fifty leagues, and experienced the benign influence of that delightful change of climate, when

———“ swiftly passing o’er the watery plain,
With wide-expanded sails, they plough’d the main;
“Till the light vessel cross’d the dreary way,
“Twixt Albion’s mists, and bright, unclouded day.”

“ Whilst running down the Spanish coast, though far out of sight of land, a robin, an owl,* (differing from any English species,) and that most diminutive of European birds, the golden-crested wren,† alighted on the deck.”

“ It is the opinion of seamen, that land birds are blown out to sea by storms, as they are sometimes seen at the distance of eight, or even twelve, hundred miles from any shore.”

Dr. Withering agreed, that “ birds might be blown off the land to great distances by violent storms; but they were also remarked when the wind neither was, nor had been, so strong as that

* *Strix passerina*. Lin. The smallest of the owl kind, not larger than a blackbird.

† The latter has been observed, by Mr. Pennant, annually to cross over from the Orknies to the Shetland Isles;—a long flight (of sixty miles), for a little creature measuring scarcely an inch in length when stripped of its feathers.

would imply, and when the birds were able to fly for a length of time about the ship, in every direction, regardless of the current.

It is true they came with the wind blowing from the land, but it was in cloudy or hazy weather; and when the gale equally prevailed in the same direction, if the atmosphere was bright and clear, no birds arrived; so that a more probable conjecture seems to be, that, having lost sight of land during the haze, they, thus bewildered, might yield to the impulse of the storm, rather than attempt to fly against it, when uncertain of their direction; and that the cloudy and misty atmosphere is the more common cause of their wandering over the sea, in consequence of its rendering them incapable of distinguishing the land from the water. From the birds noticed to be drowned in the course of a few days only, (for those which once touch a wave never rise again,) it may be inferred that the number thus perishing must be very considerable."

The much agitated question respecting the winter retreat of swallows, induced the Doctor to make inquiries respecting these birds of passage, from seamen who had been many years engaged in cruising in the track supposed to be passed in migration. It was admitted that vast flights of swallows often alighted on the rigging, about the expected seasons; and this Dr. Withering had himself opportunity of observing. He was also convinced that large numbers remained in Britain throughout the winter months, lying in a

torpid state, in the clefts of rocks, and beds of reeds or willows: he considered the fact of migration equally proved; and reconciled the opposite hypotheses of naturalists, by supposing that the early hatches, which had acquired sufficient strength for the excursion, passed over to warmer climates, whilst the later broods sought an hybernaculum at home.

The different species of swallows may be often observed, in early spring, flitting about peculiar places, long before the arrival of the multitudes which are seen during the summer; and, in like manner, individuals have been noticed, transiently, on the wing, several weeks after the general disappearance, and even so late as in the month of November.*

“ In fair weather a heavy dew began to fall rather before sun-set, but if the wind veered ever so little towards the north, it soon disappeared. It generally vanished every evening about an hour after sun-set, though sometimes returning again so as to moisten the decks as much as on its first setting-in.”

The fourth morning arose fine, the breeze having abated; and the sun shone out powerfully, re-animating the invalids. Each succeeding day was equally delightful, enabling the prisoners al-

* These observations equally apply to all other birds of similar habits, and a remarkable illustration occurred in the preceding year; when the cuckoo was unquestionably heard on the 13th of February, in Warwickshire, and, on or about the same day, in Staffordshire.

most to live above board. "The uninterrupted sun-shine, the bright moon-light evenings, the brilliant canopy of stars, and nearly glassy ocean, rendered them insensible to the protraction of the voyage; and, though lying four days within view of the heights called the Rock of Lisbon, no impatience to be set ashore was betrayed. Indeed, Captain Yescomb did all that unremitting assiduity could do, to make the confinement as little irksome as possible."*

Notwithstanding the inconveniences to which every one was subject, all was good humour; and the spirits of the most drooping revived, on beholding the magnificent prospect which burst on the view whilst gently floating with the tide up the Tagus, on the 3d of November. The bold shore, the rocky and mountainous country, the elegant white buildings, the forts, the shipping, the palaces, and the convents, appeared in their most fascinating guise.

On entering the noble river, the following impromptu lines were produced from the elegant pen of Mr. N——.

"Fraught with a cargo of the richest ore,
Our bark secure in golden Tagus rides;
A happy welcome's heard along the shore,
Proud of pre-eminence she swells her tides.

"Tis not the gold that rich Brazilia sends,
No, nor the gem that's from far India brought;

* This officer soon afterwards fell in action, bravely defending his ship against a French vessel of superior force.

'Tis not the power which Afric's traffic lends,
With human misery so richly fraught.

Britain consigns to this benignant clime,
Of all her treasures what she values most ;
Beauty,* array'd in Virtue's robe divine,
And true Philosophy,† her happiest boast.

Thou blest Hygeia lend an ample aid,
Sanction my prayer with one seraphic smile ;
The most sincere that ever votary made,
Oh ! send them back in health to that fair isle."

How transported must have been the ardent naturalist when, instead of the "dark dismal November" of the north, he beheld in native luxuriance the great Aloe, (*Agave Americana*,) forming impenetrable fences, and proudly rearing its lofty head crowned with centennial fruit ; the Prickly Pear, (*Cactus opuntia*,) the Date-bearing Palm, (*Phœnix dactylifera*,) with others of that towering genus, the tender *Magnolia*, flourishing without care or attention, the dusky olive, and figs, grapes, almonds, and pomegranates abounding. The trees were still laden with oranges, lemons, and citrons, large quantities of which, though in an unripe state, were already collecting for exportation.

Even during the voyage the Doctor's appetite and strength had improved ; much more rapidly

* Miss Emma Grosvenor, who unhappily sunk beneath that cruel disease, from which exemption is vainly sought in Portugal.

† Dr. Withering.

did he recover on shore, amidst bright sunshine from morning to evening, occasional refreshing breezes, and the thermometer indicating from sixty-four to sixty-nine degrees, without any sense of sultry or oppressive heat. "Just at sun-set," he observes, "the atmosphere feels cool, and then we shut our windows, but in an hour this chilliness passes away, and we often open them again before bed-time."

1793.—Towards January commenced the nominal winter season, which usually lasts about two months, with heavy and continued falls of rain; but never with such severity as to prevent peas and beans, though as rarities, appearing in the markets soon after Christmas, and asparagus in abundance in February.

Six weeks residence in the Portuguese metropolis, afforded ample opportunity for viewing whatever might be worthy of notice in that city; and, as the party did not deem a constant succession of dinners, balls, concerts, and routs, an equivalent for the disgusting filth of the place, which truly, in the language of Falstaff, might be said to emit "a villanous compound of horrid smells," it was determined to withdraw into the country; and, (the little colony having been augmented by another English family,) to engage a

spacious house, called *St. Jozé de Riba Mer*.* It was situated five or six miles lower down the river, surrounded by agreeably diversified pleasure grounds, and commanded a delightful and animated prospect over the bar to the ocean.

This place lay on the road to Cintra, which has been denominated the paradise of Portugal, "consisting of a village seated on the north-east side of a range of peaked hills, on the most western coast of the kingdom. The vapours exhaling from the bosom of the Atlantic, arrested by the lofty summits of the mountains, (after condensing and forming a canopy, which almost perpetually overshadows the hills and the rich vale to the eastward of them,) trickle down the steep declivities in numberless refreshing rills; producing a verdure on the ground, and a luxuriance in the trees, (especially the umbrageous cork-tree, *Quercus suber*,) not to be found elsewhere."

At St. Jozé, with a select society, time passed most agreeably. The younger branches of the united families pursued improving studies, each day closing with the dance and the song. Nor was the Doctor's assistance wanting, by a course of familiar lectures, to initiate them into the pleasing paths of Natural History.

Himself of opinion that the progress of education, far from being limited to the period of youth,

* From its proximity to the convent and church of St. Joseph, on the banks of the river.

in fact never ceases ;—that this life, altogether, is but a state of infancy, leading to progressive improvement through eternal ages ; was ready with returning strength, eagerly to embrace new and enlarged views of the ever-varying creation.

Visitors from Lisbon not unfrequently arrived, and were cheerfully admitted to the hospitable board. By the kindness of Dr. Vandelli,* the superintendant, access was obtained to the royal museum and managerie attached to the palace of the Ajuda ; as also to the cabinet of minerals from Siberia, formed by professor Pallas.†

The gardens also were luxuriant in varied vegetation : there flourished the Bananas, (*Musa paradisaica*,) or rather, perhaps, the Plantain tree, and the very rare Dragon tree, (*Arbordraconis*.)‡

* Senhor Domingos Vandelli, late Professor of Chymistry and Natural History in the University of Coimbra, a situation which he relinquished in disgust, not being able to form a respectable class out of three thousand students.

† Among the South-American productions were horned cattle so diminutive as to render credible the account of their being devoured by the *Boa Constrictor* ; preserved specimens of that enormous serpent ; a stud of Zebras, which by order of the late King had been in training for the state equipage, but which could not be thoroughly subdued ; diamonds and other precious stones of all sizes and colours ; and a still greater rarity, the elastic stone, (*Arenaria flexilis*,) bending like a thin board. A slab of this fossil, according to Dr. Townson, has been presented to the imperial cabinet at Vienna, measuring more than two feet long, eighteen inches broad, and nearly one and a half inch thick.

‡ Of which Dr. Vandelli has published an account.

The Father Jozè Mariana Vellosio, a Franciscan friar, and native of the Brazils, had also enriched these collections with many uncommon plants, fishes, and insects, from those remote regions. This self-taught genius had described, preserved, and delineated, more than two thousand species, comprising several interesting novelties.*

These gentlemen, together with the Abbè Corrêa da Serra,† secretary to the Royal Academy of Lisbon, a man of rare talents and endowments, were the most prominent scientific characters of that period; and with them Dr. Withering maintained a friendly intercourse.

Certain members of the Diplomatic Corps likewise often joined the circle; and among the early associates may be named Dr. Joli, attached to the Russian embassy, an amiable Swiss, "in every

* Father Mariana's method of preserving fishes, (dried, varnished, and attached to pasteboard,) was both elegant and durable. From him also was learnt the manner in which diamonds are obtained in the Brazils; a process not dissimilar to that used in the stream tin works of Cornwall. Descending from the mountains, they are chiefly found by the sides of rivers, where the water has washed deep ravines. Under the vegetable mould is a stratum of sand, beneath that clay, and still deeper another course of clean sand, in which are deposited gold dust, diamonds, and rounded pebbles. These strata lie nearly in a horizontal position. The diamonds are sometimes angular, but more generally rounded. One has recently been brought to the Museum which weighs nearly an ounce.

† Since employed, for several years, as Ambassador from Portugal to the United States of America.

part of whose character," in the words of Dr. Withering, "intrinsic goodness conspicuously shone;" and Mrs. O'Neill,* a lady of fascinating manners and exquisite poetical taste.

Objects of interest were daily explored on *burros*; nor were the long-eared palfreys so despicable as the donkeys of more rigorous climates.†

In these little excursions the urbanity of the peasantry excited both surprise and admiration. This deportment has been partly attributed to their innate sense of dignity as an ennobled race,‡ which forbids their engaging in many menial offices, and frees them from that *mauvaise honte*, so embarrassing to the generality of rustics. However this may be, the strangers seldom met a

* The Hon. Harriet Frances O'Neill, wife of the Right Hon. John O'Neill, of Shanes Castle, in Ireland. This interesting lady died in Portugal. Her husband, after having been created Baron O'Neill, fell beneath the pikes of the rebels in 1798.

† The longevity of the ass has been generally admitted, but few facts have been adduced in support of such opinion. It may here be stated as unquestionable, that one used for domestic purposes at St. Jozè died in its forty-first year; and another now daily employed there, in raising water at the Nora, has already attained the age of thirty-two years, without exhibiting any marks of decay.

‡ After the signal victory gained by Don Alonso, (in 1139,) on the plains of Ourique, which reduced the power of the Moors, and established Portugal an independent kingdom, the conqueror granted the honours of nobility to all his followers. It may likewise be worthy of remark that Portugal under the feudal system, had no villains or slaves attached to the land.

Portuguese without receiving a most courteous salutation.

Another singularity of these people is the readiness with which they indulge in the gift of the *Improvisatore*. Often do the vine-dressers break forth into irregular eclogues or bucolics, which remind the classical hearer of

“The Mantuan’s Georgic strains.”

Nor do the females, employed in washing on the banks of brooks or rivers, beat the linen against the massy stones, without the cadence of song.

Sailing on the Tagus was enjoyed with less apprehension of sudden squalls, than in the bays and harbours of the north. The boats there used are of great variety as to size and figure, exhibiting in one scene the large *frigata*, the crescent of the Costa, and the elegant latine sails peculiar to the oriental and southern seas, with those of more ordinary construction. The watermen are chiefly supplied from the kingdom of Algarve; an herculean race, from whose athletic trunks, generally exposed, Appolonius Nestor would have modelled a Torso.

The cold during this winter (1792-3,) did not exceed thirty-eight degrees, so that the progress of vegetation was never suspended, and the succession of flowers afforded ample amusement.

The ash-tree, (*Fraxinus excelsior*,) was in flower, and the elder (*Sambucus nigra*,) put forth its leaves,

about the middle of January, and other plants were at that time as forward as in England they would have been in April.* Swallows were observed on the wing towards the end of January; banks were then clustered with the pretty *Narcissus tazetta*, *Bulbocodium*, *Iris pumila*, *Asphodelus ramosus*, and *fistulosus*; and meadows matted over with the *Acanthus mollis*, whose leaves adorn the capitals of the Corinthian order. Here the lofty Cypress seemed to indicate the origin of the tapering spire, (as the intersecting branches of the double row of elms describe the gothic arch;) whilst there the (*Cercis siliquastrum*,) Judas, or tree of Love, was covered with a profusion of crimson blossoms.†

The Catalonian jasmine, (*Jasminum grandiflorum*,) ascended the walls of houses, exhaling a delicious perfume throughout the winter months; fields of Lupines, (*Lupinus albus*,) might be seen on all sides, the seeds being cultivated for soups; and the useful Esparto grass, (*Lygeum Spartum*,) which is manufactured into ropes and mats; with the great reed (*Arundo donax*,) also valuable for domestic purposes.

Dr. Withering considered "the whole country immediately surrounding Lisbon as volcanic; and

* For other remarks on the foliation of trees, vide Appendix, No. xviii.

† This tree, so splendidly empurpled with blossoms, is not less remarkable for yielding a wood exquisitely veined with black and green, and susceptible of the finest polish.

the harbour itself an immense crater, in diameter measuring about three miles. The basis of the volcano still continues in an ignited state, and whenever the periodical rains, (falling about the end of October,) are so great as to cause a high land flood upon the river, the water finding its way to the yet igneous mass, produces more or less of those convulsions called earthquakes."

Pumices and scoria still remain scattered over the surface of the earth in many places; and the springs about Poço de Bispa, (the Bishop's Well,) adjacent to the city, emit a copious and regular supply of hot water. These indications, together with the heaps of ruins remaining since the last calamitous overthrow, cannot but keep the inhabitants in perpetual dread of a recurrence of that awful catastrophe,* which reverberated even through the caverns of Derbyshire.

Notwithstanding the Doctor's earnest desire to avoid professional engagements, and his steady resolution to decline all remuneration, applications were made with an importunity which was too often irresistible. Happily the more alarming symptoms of his own case greatly abated towards March; when the family found it expedient to remove to *Braço de Prata*,† situated

* This event happening on the day of All Saints, (November 1, 1755,) when the churches were crowded with devotees, and the altars blazing with innumerable tapers, spread fire and devastation all around.

† The *Silver Arm*: so named from a proprietor, who, having lost his own arm, substituted one of silver.

three miles eastward of the city, in a district more shaded with trees than that to the west of Lisbon. "It was hilly, or rather might be said to consist of an assemblage of little hills, cultivated for corn, or wine, and interspersed with olive grounds. The prospects* on ascending each elevation, or winding along the valleys, were most agreeably diversified, generally terminating in mountains to the north, in lower and still more distant lands, partly covered with Pine-forests,† to the south; in the capital and its environs to the west, and in an extensive lake to the east; for the Tagus is very inadequately conceived of as a river."

"It is in fact," observes Dr. Withering, "a great salt-water lake, thirty miles long, and half as many in breadth, with a narrow outlet into the ocean, and receiving into itself the tributary waters of several rivers, amongst which the Tagus, properly so called, is the principal, entering the lake twenty-eight or thirty miles above the city."

Often has the Tagus been compared with the Egyptian flood, in the fertilizing effect of its periodical overflowing, but this river resembles

* The air being free from vapour, the sky appears of a much deeper blue than in England, and the meridian sun is much hotter than at an equal altitude there. "This rarity of atmosphere exists to such a degree, that it is said from the Jesuit's Convent at Santarem, may be discerned with the naked eye the steeple of Grace in Lisbon, a distance of fifty miles."

† No mine of coal having been discovered in Portugal, Pine wood constitutes a principal article of fuel.

the Nile as little as do most others in Europe. It overflows its banks after continued heavy rains, or the sudden melting of snow among the Spanish mountains. When these two causes operate conjointly, the flood is very great, and does infinite mischief, particularly if it happen late in the spring; it being then too late to re-sow the low lands, and under this destructive influence they produce nothing but a rank, coarse grass, scarcely worth the trouble of cutting.

A flood appearing early in December, and occasioning damage to the towns adjacent to its course, inundating warehouses, and other buildings in low situations, may, nevertheless, operate no material injury to the crops which are to follow, the corn not having been sown at that period. Whole years sometimes pass without any other flood than that of the smaller streams; these swell with every heavy rain, and subside again after a few fine days.

The last great inundation occurred in the year 1766. The previous winter had been dry; and excessive rains during March and April being augmented by the melted snow from the mountains, descended in an overwhelming deluge. It totally destroyed the harvest on the low lands, and did great mischief in other respects; but even this formidable torrent was no otherwise perceptible near the metropolis than by the wreck floating past the town, together with some cattle, many hares, rabbits, and numerous reptiles, which crept up the sides of the ships in the harbour.

"The catastrophe is to this day denominated "the flood of April," and from some such undesirable visitation probably originated an old adage of the country, "When famine visits Portugal she comes swimming."

The villas are generally provided with a *veranda*, or open gallery, exposed to the cooler aspect, and are situated in more or less of ornamental grounds, called the *Quinta*.* That of Braço de Prata comprised about a dozen acres of vineyard, and a shrubbery, the natural produce of the soil, extending to the edge of a cliff over-hanging the water. This little wilderness was chiefly composed of the Ever-green and Kermes oaks, (*Quercus ilex* and *Quercus coccifera*,†) the *Colutea*, *Rhamnus*, *Pistachia*, pine, laurel, and *Alaternus*, the interstices being filled with various kinds of cistus, myrtle, and other odoriferous flowering plants. Thus was realized the

"Litora myrtetis lætissima;"

rendered still more attractive by the sweet song of nightingales; where

"Ev'n the rough rocks with tender myrtle bloom,
And trodden weeds send out a rich perfume."

* A portion of the estate thus named from its originally being supposed to comprehend about a fifth part.

† The Kermes oak likewise grows profusely on the Arabida mountain, and there produces the glandular excrescences, occasioned by an insect, which yield the valuable purple dye.

But these advantages were for a while counteracted by bad weather, and imperfect means of guarding against cold.

In the succeeding month Dr. Withering resolved to fulfil his intention of visiting Caldas da Rainha, the hot baths of Portugal, lying nearly seventy miles north of Lisbon, and which have been long in high estimation for the cure of various chronic diseases. He had undertaken to analyse these medicinal springs by desire of the government, and received every facility which the *Avizo*, or royal mandate, to the respective *Providors* could insure; notwithstanding which, what would have been considered in England as only the journey of a day, was in Portugal a formidable undertaking, from the miserable accommodation on the road, and the difficulty in making progress.

Dr. Withering was accompanied in this excursion by Mr. Pearson, Dr. Joli, and an interpreter; and after remaining a few weeks at the bath, and completing such processes as were necessary for developing the qualities of the water, returned to Braço de Prata, though not till he had also prepared a memorial on the state of the National Hospital at the Caldas, by which the indigent are afforded an opportunity of benefiting by the baths and waters.

"This is certainly a noble institution," he remarks, "and the building possesses advantages superior to any hospital that I have seen elsewhere; but the admirable design of the architect has been in a great measure frustrated, by the mode of fitting

up the wards and the beds." With a view to remedy these improprieties, several improvements in the construction and regulation of the establishment were suggested, and have since been adopted.

"The water," he observes, "is *truly efficacious*, and, from its multifarious ingredients, proved the most arduous undertaking that hitherto has succeeded in this kind of analysis. In the month of May, annually, all the patients from the different hospitals of Lisbon thought proper for the waters are moved to the Caldas, and continue there through the summer, or until they obtain a cure."*

The springs are enclosed in a handsome stone building, and, besides the well at which the water is drank, there are four large baths in as many separate apartments. The men's bath is thirty-six feet long, nine wide, and about two feet eight inches deep in water, thus containing eight hundred and sixty-four cubic feet of water, and this quantity is supplied in little more than a quarter of an hour. The springs discharge not less than sixty cubic feet each minute, or three thousand six hundred cubic feet in an hour. The

* The disorders most susceptible of relief from such a course are bilious complaints, paralytic affections, rheumatism, and gout. For the particular ingredients the reader is referred to the analysis, which will be found among the Miscellaneous Tracts.

In 1791 a small treatise had been published by Dr. Francisco Tavares, entitled "*Advertencias sobre os Abusos e legitimo uso das Aguas Mineraes das Caldas da Rainha*;" but this tract contained only vague conjectures, without an investigation of the component parts of the water.

waste water runs westward from the town, and at the distance of a few hundred yards below the baths it is received into a trough, which conducts it to an overshot mill-wheel. The sulphureous smell of the water is generally perceptible at some distance from the springs, but the intensity of this odour varies with circumstances affecting the circumambient atmosphere.

The Doctor, likewise, took occasion to view the very singular town of Obidos, situate about a league from the Caldas, which probably contains within its walls more uncontaminated Moorish blood, than any other portion of the Peninsula. The inhabitants, who are lineal descendants of that people, still pertinaciously adhere to their African customs; and refuse, even at a period thus remote from their ascendancy, to intermarry with the Portuguese.*

* It may be presumed that the sea once washed the walls of this place; massy iron rings for the mooring of vessels still remaining attached to them.

Vestiges of Moorish domination may be traced in every part of the kingdom; particularly in the style of many ancient edifices; the high walls, the latticed *jalousies*, the adoption of Mauritanian or Arabesque words, easily traced in the names of places, plants, minerals, &c. even by a superficial observer; the hydraulic machine used for raising water, (composed of cog-wheels, which give rotation to a chain of earthen vessels,) called a *Nora* in Portuguese, (a contraction of *Na-Ourah*,) the mode of carrying water on the head, of threshing corn by the trampling of muzzled oxen, of bearing long poles, sometimes pointed with iron, and of using them as weapons, with other obvious exemplifications.

It has been gratifying long since to learn, from British officers who had marched through Caldas to join the army of the Peninsula, that, transient as was the Doctor's visit to that place, the worthy inhabitants still retained a pleasing and respectful remembrance of him and his associates.

Dr. Withering felt it a duty he owed to society to offer some observations upon the climate of Portugal, as an asylum for invalids from the northern parts of Europe; a subject which he conceived had been mistaken by the generality of practitioners. It is to be lamented that illness, together with other engagements, prevented the accomplishment of this design; though it is hoped a tolerably correct idea of his sentiments may be gleaned, from the notices scattered through this volume.

The general result of his experience may be here presented in his own words:—"Perhaps the climate of Portugal may rather be deemed *inefficacious* than *unfavourable* in consumptive cases:" though subsequent passages extracted from a letter to John Theodore Koster, Esq. would warrant a conclusion still less encouraging.

"He who has not made the attempt, cannot conceive the difficulty there is in ascertaining a simple fact of this kind. A Portuguese Doctor, in great practice, informs me that the *native consumptives* are very numerous:—that he had attended many in the course of a year, and that the progress of the disease was *much more rapid* than in England.

“ All these points were confirmed to me by the physician resident at the Caldas; and my own observations can testify to the hasty strides of the disorder in English and Irish constitutions. I can also vouch for the disease *originating in the climate*, as it did in a female domestic of the family, whose life was only saved by the most timely exertions; and in a young man-servant who had no marked predisposition, was exposed to no infection, was perfectly temperate in all respects, but whose case terminated fatally.

“ On this matter none but a practitioner can give competent evidence; and few others in England, except such as have suffered by the loss of relatives, know any thing of it; and not many medical men are sufficiently aware that *Phthisis is contagious*. Though some writers positively deny that *Phthisis pulmonalis* is infectious, the contrary fact is to me indisputable. That fifteen hundred ‘*Ptizicas*’ (consumptives) may be seen at once lying in the General Hospital in Portugal is a strong fact, which cannot be done away by adverting to a scrophulous, or other extraneous origin.”*

Corroborative documents will be found in another part of the work;† and, though this may

* The number of *Ptizicas* who die annually at Lisbon, in proportion to the population, will be found to be nearly as great as the consumptives within the bills of mortality of London; which amount to nearly one-third of the whole deaths!

† Vide Observations on the Temperature and Climate of the South of Europe in the sequel.

be deemed a strictly medical question, it is one of such vital importance to numerous families, that it is presumed the warning here inserted will not be unacceptable to the general reader.

Let those who meditate the removal of a relative or friend from every interesting and tender connexion, and the nameless comforts of home, consider these facts; and pause ere they rashly embark on a foreign expedition;* which can afford no prospect of rescuing the object of their solicitude, but must, in all probability, greatly aggravate suffering, by subjecting the invalide to many inevitable privations.

On searching the records of deaths and burials at Lisbon, however incomplete they may be, it is but too easy a task to

“ Trace the long roll of death, and sorrowing tell,
How, mark'd by Fate, the best and loveliest fell.”

Though it was generally understood that Dr. Withering studiously avoided the practice of his

* It seems to have been customary, in ancient as in modern times, to transport these unfortunate invalids from their native home to warmer climes. Thus the physicians of Britain recommend their patients to Lisbon; the Portuguese send theirs to Cadiz, with probably little better success; and the Romans were wont to prescribe Egypt, particularly Alexandria; as appears from a letter of Pliny the Consul to his friend Paulinus, in reference to the freed-man Zosimus.

profession, the jealousy of a few of the faculty was surprisingly excited. One in particular spared no pains to vilify him on all occasions, denouncing him as "a man of no eminence in England, who had merely extorted a spurious reputation from the ignorant."

The unbecoming expressions of this invidious person moved the indignation of our philosopher's friends, but by himself were treated with disregard. Before quitting the country he was enabled to take a noble revenge, by overcoming evil with good. The only daughter of this calumniator was on the point of marriage with a man of specious appearance, who was introduced as a regular physician. The circumstance chanced to reach the ear of Dr. Withering, who, having reason to doubt these pretensions, caused inquiry to be made, and a caution to be given to the unsuspecting young lady and her parents. The affair was suspended, till, with no small trouble, conclusive evidence was obtained that the stranger was a needy adventurer, utterly unworthy of regard.

Thus to serve a family from whom he had experienced the most hostile disposition, he incurred the violent displeasure of an unprincipled impostor; who, passing over to England under the pretence of seeking self-justification, was unexpectedly secured in gaol! The rage of the disappointed *enamorado* could only be equalled by the gratitude of the amiable girl and her parents, on discovering the benevolent interposition. They

hastened to hail him whom they had so recently traduced, as "the saviour of their child, the protector of their domestic comfort:" not knowing in what terms to express themselves, (according to the tenour of a letter on the occasion from the father,) "for so humane, noble, and generous an action."

Thus we see, adopting the language of Melmoth, that "Generosity would lose half her dignity, if Malice did not contribute to her elevation; and he that has never been injured has never had it in his power to exercise the noblest privilege of heroic virtue."

The false maxims of honour too prevalent in the world, might, with some parties, have produced further consequences. However improbable in the present instance, we may here allude to Dr. Withering's sentiments on duelling; and they cannot be better illustrated than by the following sketch of an answer to a supposititious challenge, found among his papers.

"Sir,

"I received your note; the purport of which, if I am not mistaken, is a request that I would fix upon a time and place, that you may have an opportunity to kill me. But it further implies, that I may also have an opportunity of killing you; and this you call '*satisfaction*.' It may be so to you. Permit me, however, to assure you, that it would be no satisfaction to me to kill you, or any other man; therefore, until our ideas can

be more properly adjusted, you must allow me to decline meeting you upon such unequal terms.

“ I have the honour to be, &c.”

In fact, he reprobated the practice as a remnant of Gothic barbarism ; in itself a most equivocal test of courage, not unfrequently arising from a deficiency of proper resolution. “ The sacred term of principle,” as he expresses himself, “ is often misapplied to motives, which, having no solid foundation, change with circumstances and with times ; and honour, bright honour, is as illusive and unsubstantial, as the evening clouds tinged by the setting sun. There are no guides to human actions equal to the principles of genuine religion, and no self-vaunting honour can stand a brunt with sturdy morality.”

The weather having become unpleasantly hot, Dr. Withering embarked, on the 14th of May, on board the Howe packet, which had been selected as the fastest sailing vessel on the station ; an important qualification when the seas were covered with hostile cruisers, in consequence of the recent declaration of war. An armed cutter sailed in company, affording some additional protection. Notwithstanding the disagreeable possibility of being carried to France during the reign of terror, the ship was crowded.

After repeated alarms from privateers, and being chased considerably out of the proper course, on the 1st of June the Scilly Islands were descried. The night set in rainy, stormy, and excessively dark; and in attempting to pass between these inhospitable crags and the Land's End, it appeared that the perils of the voyage were reserved for the conclusion. The cutter no longer answered signals. The packet happily escaped these trammels; but did not enter Falmouth harbour till the 3d of June, after a tedious passage of nineteen days.

The Doctor landed in a debilitated state, and, in his progress towards Edgbaston, only once deviated from the direct route, to view the venerable Spanish chestnut-tree in the grounds of Lord Ducie, at Tortworth. This is supposed to be the most ancient tree on record in Great Britain, having been a land mark in the time of King John.*

During the summer was produced a reprint of the "*Account of the Scarlet Fever*," with an additional chapter containing remarks on the nature and cure of ulcerated sore throats.

At Lisbon Dr. Withering learnt a method of slaughtering cattle, less objectionable than that which is practised in this country. By inserting a knife, or stiletto, at the setting on of the head,

* The trunk measures nineteen yards in circumference, though mouldered by the lapse of ages to no more than fifteen feet in height. It still retains a few living branches which bear fruit.

or nape of the neck, the animal falls instantly dead scarcely conscious of pain.* This operation is also frequently performed with great dexterity at the bull-fights, sometimes with the head of a spear, when the bull has been disabled for further combat.

In the hope of introducing this preferable mode, proper instruments were distributed to several butchers, but such was the prejudice against all innovation that scarcely a trial could be obtained.†

By its general adoption how greatly would the sum of animal misery be reduced! To enforce a practice so humane seems scarcely beneath legislative interference.

The approach of winter was viewed with apprehension by Dr. Withering, and, however, unwilling again to venture abroad, he felt a foreboding that no less a sacrifice could prolong his

* The blade is about five inches long, two-edged, one inch broad at the handle, and tapering to a sharp point. The handle has a groove at the top, in which is placed the thumb of the operator when the weapon is held for execution, and it is forced by the pressure of the hand alone into the spinal marrow.

† It appears that Lord Somerville has been equally unsuccessful in a subsequent attempt to accomplish this benevolent purpose.

existence. His friends still remaining in Portugal proved a great inducement once more to proceed thither, but the aspect of public affairs was portentous.

In the midst of all the storms and darkness which obscured the political horizon, he still hoped for happier times, remarking that "The abuses of some governments have long been acknowledged, and we have learnt the miseries of discord and anarchy. Our estimate hereafter may be made upon a juster scale, and whilst the mischiefs of mob-government are shunned on the one hand, the oppressions of tyranny will be spurned with the other."

On the 21st of October, accompanied by his son, he again quitted Edgbaston. At Clifton he took a few short rambles to gain further insight into the phenomena of St. Vincent's rocks. He conceived that these rocks, rising abruptly to a stupendous height from either bank of the Wiltshire Avon, "demonstrate the former force of the volcanic fire, whose remains still warm the waters. But the tepid springs* are not," he observed, "confined to the Well-house. Others lower down the course of the river may be seen issuing from the base of the rocks."

Calcareous chrystals, as might be expected,

* An accurate thermometer placed in a glass, and the water from the cock at the Well-house suffered to run upon it for five or six minutes, indicated seventy-two degrees. In a spring issuing from St. Vincent's rock, at its base, but a few yards above the level of the river, it showed seventy degrees.

abound ; and for the formation of *silicious* chrystals in the interstices of the limestone, (the hills being purely calcareous, without the least appearance of other silicious matter than the incrustation which lines the surface of some of the cavities and fissures,) he ventured to account, by supposing that "the subterraneous fire lies very deep in the granite stratum ; that the silicious granitic matter being dissolved by the water, is raised with it in vapour through the crevices of the superincumbent strata of limestone ; and that the deposition of chrystals takes place on the vapour cooling ; but that some portion of the vapour, when condensed, finds a passage out at the present apparent base of the rocks before it be perfectly cooled.

The correspondence of the face of the acclivities on the opposite sides of the valley, and the various inclinations and dippings of the several strata, clearly indicate the above mentioned cause ; and the roughness which the water leaves for a length of time on the tongue after being drank, induces a suspicion that it still contains a portion of silicious matter in a diffused, if not in a dissolved state."*

* The presence of silicious matter seems not to have been detected by other chymists. Dr. Withering, on further investigation, became fully convinced of the fact ; and to this ingredient he attributed that degree of efficacy which the Bristol waters are allowed to possess in the cure of Diabetes. Hence he was led to adopt a novel mode of practice, (detailed in a subsequent part of this work,) which, so far as his experience warranted, proved successful.

Here he had the pleasure to meet his amiable friend, Dr. Moyes; and to renew an intercourse with Dr. Beddoes, than whom he deemed "no man more likely to improve the practice of physic: possessing knowledge, discernment, ardour, and invention, with intrepidity to despise the sarcasms of many of his brethren, less bountifully gifted;" though he felt confident he would "find it less easy to establish improvements than any one would imagine, who could not of himself say, *experto crede Roberto*."

That philosopher then entertained sanguine hopes of a beneficial result from the inhaling of factitious airs. Pneumatic medicine had also been adopted in Birmingham, and pursued, till experience proved it scarcely applicable to the generality of cases, or circumstances of patients.

At Falmouth Dr. Withering continued a fortnight, enjoying, as much as his sufferings from cough and febrile exacerbation would permit, the society of several Cornish gentleman; particularly of Davies Giddy, M.P. Dr. May, the Rev. William Gregor, and Mr. Fox. There, also, he became acquainted with a family of high distinction, who, on his arrival, presented introductory letters, and awaited the same destination.

The waters of Geyser, (vide Travels in Iceland, by Sir George Mackenzie, p. 396,) contain a large proportion of silica; reasoning, therefore, from analogy, may not some important inferences be deduced?

The party sailed on the seventeenth of November, in the Expedition packet; and the convoy of a frigate, to the latitude of Cape Finisterre, banished all fear of being captured. No adverse incident occurred; and, on the eighth day only after departure, the ship anchored in the bay of Cascaes.

At night was observed that luminous appearance of the water, brilliant as the electric flash, but supposed to be occasioned by a small, gelatinous, and noctilucous species of Medusa.

After passing the desert rocks, called the Barlangas, on the highest summit of the Penha, was discernible the abode of a few *Religieux*, who, bound by a solemn vow never to look upwards, have wisely fixed themselves on a pinnacle which commands the most diversified prospect imaginable. Beneath the retreat of these enthusiasts may be seen vestiges of Moorish works, amidst stupendous masses of native rock. Not far distant stands a Roman temple dedicated to Cynthia, (hence Cintra,) converted by the Mahometans into a mosque, and, since their expulsion, used as a Christian church.

Whilst outside the bar, the vessel was approached by fishermen, and others who plied a less honest traffic, all wearing the *bonnet rouge*, and using the most vehement gesticulation with an unintelligible jargon.

The entrance of the Tagus, though apparently of ample width, is narrowed by large sandbanks. The north passage is commanded by

the castle of St. Julian; the south by the Bugio round fort, founded on an insular sand rock; and the course of the river, bordered with the "golden sands" celebrated in ancient verse, is defended by a chain of batteries on either side.

Amidst the diversity of grand objects, comprehended in this panorama of the Lusitanian capital, extending over several hills, and presenting towers, and domes, and minarets, with other stately structures; the venerable church and monastery of St. Jerome, at Belem, with its richly-sculptured front of golden hue, was peculiarly impressive.*

It was necessary to remain another night on board the packet. The evening was calm; and, though lying close to so vast an assemblage of human habitations, few sounds were heard, save the occasional chime of bells; nor was the azure vault of heaven obscured, even at midnight.

Having completed the "*Memorial on the Caldas Waters*," Dr. Withering, (introduced by the Secretary of State, M. Pinto,) presented it to the Royal Academy, and had the honour to be admitted a Foreign Corresponding Member.†

* There repose the mortal remains of kings; and thence, though from a more humble fane, the adventurous De Gama sought new worlds. Returning with the promise of Indian treasures, the present edifice was raised in gratitude by King Emanuel.

† Many valuable works have issued from the press of this learned Society, to copies of which each member is entitled free of expense.

The little treatise appeared both in the English and Portuguese languages. A more rare specimen of ingeniously devised and accurately executed experiments, has seldom been produced : the accomplishment of which cannot but be considered as a remarkable instance of a vigorous mind, prevailing over bodily infirmity.

The benefit derived from the first season in Portugal was not wholly attributable to the climate, but partly to the comparative quietude he there found, an advantage which circumstances no longer permitted him to enjoy. His acquaintance unavoidably extended, and English visitants increasing, appeals to his humanity could not be resisted : thus his mind became harassed, and suspecting also that the exposed situation of Braço de Prata might be injurious to him, he resolved to seek a more sheltered spot.

That truly patriotic nobleman, the Duke de la Foens, made an offer of a palace belonging to his family for the accommodation of Dr. Withering, which, however, was gratefully declined ; and, early in January, 1794, the party re-occupied St. Jozè de Riba Mer.

1794.—At the commencement of the year Dr. Withering thus reports of himself :—

“ I am far from well, and the weather is so different from what it was at this time last year,

that to escape future attacks is all that I must look for at present. But we are promised a fine spring, to commence in a month or six weeks, to compensate for the rain, the clouds, and the want of sun, experienced since our arrival."

At St. Jozè, though the weather continued cold, (the thermometer, on the night of the eighteenth of January, indicating only nine degrees above the freezing point,) his health sensibly improved. He examined and preserved several hundred specimens of plants, paying most attention to such as were likely to illustrate the British species. Nor were even his limited researches unrewarded by some novelties. The Cryptogamia were very few; neither were they requisite to sustain the interest of the botanist, where the most beautiful flowers present themselves in uninterrupted succession throughout the year.*

Since the establishment of the Brazilian colonies, (the Portuguese government chiefly relying on a foreign source of revenue,) agriculture has declined, and nearly two-thirds of Portugal remain uncultivated: yet is it obvious how deservedly that kingdom has been entitled the "*Meddulla Hispanica*," and might, with little labour, be rendered abundantly productive. In the Algarve, a kingdom of itself, left almost in a state

* Vide "*Floræ Ulyssipponensis Specimen*." The collection has been deposited in the cabinet of the Linnæan Society, together with a descriptive catalogue.

of nature, the plants of Africa are said to flourish indigenously.

Heavy rains, not unmixed with *hail*, still prevailed, and some flakes of *snow* fell, which was stated to be a rare occurrence.

The several kinds of swallows never entirely disappeared, but might be observed gliding through the air under the shelter of sunny walls or banks throughout the winter; whilst the olive grounds were frequented by vast flights of starlings and redwings.

Towards February the influence of the sun became too great to admit of exercise, except early or late in the day. In April a strong northerly wind brought such a degree of cold as to compel once more the lighting of fires; and this rigour, (alternating with the sultry Siroco,) was quickly succeeded by insupportable heat. With a peculiarly oppressive warmth towards noon, the effect of the piercing cold and rarified air in the early morning can scarcely be imagined. The regular salute of the peasants, shivering beneath their long cloaks, was "*Star muito frio, Senhor!*"*

It may readily be conceived how detrimental

* Mr. Bowdler, in his valuable "Observations on Emigration to France, on account of Health, Economy, or the Education of Children," (1815,) justly remarks, that "the objection to the South of France on account of the Bise wind, is yet more strong against Lisbon in winter, where a bright warm sun too often contends with an exceedingly sharp and cold wind."

these vicissitudes must prove to delicate constitutions; and that those who reside in Portugal are liable to such, cannot be too strongly impressed upon the recollection.

Unfortunately about this time the Abbé Corrêa, for whom the Doctor had conceived a friendship, (period of life and recent acquaintance considered,) singularly ardent, became dangerously ill. The exertion and anxiety which this circumstance, contrary to every dictate of prudence, occasioned, could not but be hurtful. He had the satisfaction to see his friend recover; but was himself seized with an hemoptoe. He had remarked this alarming symptom to be less curable, and more rapidly tending to a fatal issue in Portugal, than in England; and the most skilful physician of Lisbon advised him to expedite his departure.

The last week was occupied in receiving the farewell visits of those who had, by unremitting attentions, promoted the convenience and pleasure of the English party. Among these must be named the Hon. Robert Walpole, British Minister; the Rev. Herbert Hill, Chaplain to the Factory; John Theodore Koster, Esq. and the family of Bulkeley:—nor will the kindness of many others ever be forgotten. Gratifying as were the sensations excited by such persevering assiduities, they were mingled with sincere regret; and the fatigue of so much company was no good preparative for what was to ensue.

The particular season afforded an opportunity of witnessing some of the most splendid ceremonies of the Romish church, and during these solemnities and festivities the city exhibited a peculiar degree of animation, and an unusual approach to cleanliness.

On the night of Maundy Thursday, equipages being excluded from the streets, crowds of pedestrians of all ranks securely promenaded to view the brilliant illuminations of the principal churches, and the richly decorated altars; to admire the solemn strains of the pealing organs, and the chant of choral voices; or to inhale the profusion of incense, mingling its odour with fragrant flowers.

On Easter Sunday, nothing could exceed the mirth and revelry generally prevalent. The citizens, decked in holiday attire, indulged in a second carnival; the *viola* was heard within and without doors; the *fandango* was danced midst joyous groups in the highways; the *stiletto* seemed to lie in harmless concealment, whilst jealousy and revenge yielded to softer emotions.

On the evening of the 20th of April, Dr. Withering, with his kind relations, sailed from the Tagus in the King George packet which had performed her last voyage in the extraordinary short time of ninety-two hours.

Proofs of mutual esteem were manifested to the latest moment. Some friends remained on board till the vessel was under weigh; others

hoisted colours and waved handkerchiefs on different parts of the shore, as she dropped down the river. These signals of regard were returned by hearty cheers and a parting salute. The scene was altogether affecting; so that even the hopes of again seeing old England were for the moment saddened, and, when over the bar, the last glimpse of Portugal, where

“ High o’er its summit, through the gloom of night,
The glimmering watch-tower casts a mournful light,”

was viewed with melancholy.

The packets, usually conveying a considerable amount of bullion or specie, were but too attractive to the French privateers, and scarcely a day passed without some alarm. The darkness of the nights, and laborious efforts with the sweeps, sometimes proved the means of escape; and on more than one occasion, the enemy, on near approach, was deterred by finding the ship prepared for resistance, with every man at his post, vociferating shouts of defiance, and singing national airs.

On May-day, in the Bay of Biscay, the wind blowing fresh from the north-east, towards night was accompanied by a prodigious rolling sea. Mountain waves broke over the vessel; levelled those who happened to be on deck; rushed down into the mess-room, and, at the same instant

swung in the dead-lights, forced through the
 gun-cabins, in an overwhelming torrent. The
 confusion was great; even the sick leaping from
 their berths; a gun unharnessed; cordage, spars,
 and blocks descending; veteran sailors uttering
 the fearful cry, "She can't right!" "She'll never
 right!"

"Upborne she scales the briny mountain's height,
 Then down the black abyss precipitates her night."

The return of day, so anxiously desired, did
 but exhibit the dreary horrors more completely.
 After lying-to eighteen hours, with only a single
 sail spread, and the fury of the elements attended
 with lightning and cutting hail-stones, on the 3d
 of May the storm began to subside.

In the afternoon of the 6th the Lizard Point
 was descried; and by a rapid run the ship came
 to anchor in Falmouth harbour the same night.

Truly thankful were all again to touch British
 ground, and to be liberated from nearly three
 weeks of privation and hazard: nor was their
 gratitude diminished on afterwards learning that
 the vessel which had immediately preceded
 them in the same course, and also the packet
 which sailed next after their arrival, were both
 captured.

Dr. Withering, cautiously proceeding towards Warwickshire, determined to make the detour of the coast from the Land's End to Portsmouth; including a visit to some of the Cornish mines, the Isle of Wight, and the New Forest.

"The mining for tin in Cornwall, (or sinking deep shafts to search for it in loads or veins,") he observes, "is comparatively a modern practice, introduced by the Germans about two centuries ago; the ancient tin works being what are called stream-works, formed by digging up the surface of the valleys, and washing out the ore thus found mixed with the soil. This mode is still continued; the people of these times managing the washing process better than their ancestors did, and therefore finding it profitable to search the ground again.

"It is generally agreed that the Phœnicians fetched tin from this island; and it is probable, from what we now know of the use of tin in dyeing, that the far-famed Tyrian dye rather owed its excellence to this metal, than to the shell fish which some have supposed furnished it. None but the purest tin answers the purpose of the dyer, such as is now called stream tin.

"The richest stream works are found where the rivulets in the valleys formerly interrupted the pursuit; or where their opening into the sea occasioned the like effect. But latterly, by turning the course of the streams, and by raising em-

~~washed~~ against the sea, an earth is obtained which former adventurers never deprived of its native treasures.

“ The ore so procured has evidently been washed from veins in the adjacent hills; but being all in the form of rounded pebbles, this process may have taken place whilst that portion of the island lay under water; the friction in progress from hills so little distant, being insufficient to account for the rounded figure of the particles.

“ It may likewise be remarked, that these nodules of ore, (or block tin,) are generally discovered in or upon a stratum of sea-mud, (also containing shells,) giving out a sulphureous smell, and resting upon schistus.

“ In certain spots it is not difficult to distinguish how much of the higher parts, and of the sides of valleys, have been examined by washing in former days; and at what points, the presence of water had interrupted the further pursuit of the ore.

“ In the course of the working, shovels wholly made of wood, buckets without hoops, cut out of the solid timber, and picks formed with great labour from the horns of the Fallow Deer, have been lately found. Hence, probably, the searching for tin ore was an established business previous to our knowledge of iron, and must necessarily have been a very ancient usage, iron having been

plentiful at the invasion of the Romans under Julius Cæsar.

“Several fragments of the same kind of horn, and one entire, have been dug up in the valley of Carnan, (one of the largest stream works in Cornwall,) between Falmouth and Truro, which are still preserved.*

“But it is difficult to conceive that a people capable of reducing tin ore to its metallic state, should long remain ignorant of the use of iron. It may be supposed, therefore, that the Phœnicians purchased the ore from the Aborigines, and carried it home to smelt; and that, probably, the art of smelting was first imported into this island by certain Jews.

“The tradition of the country speaks of ‘*Jews’ Houses*’ where the ore was smelted, and fragments of metallic tin have often been found about those places.

* A complete instrument made of stag’s horn was shown to the travellers, measuring nineteen and a half inches in length, from five and a half to six and a quarter in circumference, and the small cross piece eight and a half long. The small piece was wedged into the larger one, with two rudely shaped pieces of the same material, the perforation roughly cut, and none of the parts in any degree fossilized, though, perhaps, two thousand years old. The labour of constructing such a pick, of reducing it to a proper length, of boring it to admit one of the brow antler’s, (all which was probably effected by a sharp flint stone,) must have been great.

"That this industrious race of men were once largely concerned in the tin trade, is rendered probable by the names of the village at Mount's Bay, which is still called *Marazion* (the sea of Sion,) or *Market-jew*, (the trading place of the Jews.)"

Of the strata of this part of the kingdom Dr. Withering remarks:

"Throughout Cornwall, granite in most places prevails very near the surface; but in many it is covered more or less by schistus, which is much crumpled and twisted.

"About the harbour of Falmouth, particularly on the south side, at Flushing, is found a stone which the natives would probably call *Killis*, though apparently different from what they so name when raised out of the mines. The Black Rock at the entrance of the harbour is also of the same kind.

"Advancing into Devonshire, keeping the middle road, over Dartmore, we find the whole surface composed of granite.

"On descending from Dartmoor, white (*Grown*,*) and blue clay appear in the meadows,

* According to Sir George Staunton, this grown clay, (a decomposed feldspath,) is the *Kao-lin*, a principal material of the Chinese manufacturers of porcelain. With it is mixed *Pctun-tse*, (the grown stone of the Cornish miners,) a sort of

and the cliffs are composed of a sandy breccia, whose pebbles are not rounded. This seems to be cemented by iron.

“ The singular coal mine at Bovey, eight miles from Moreton, has been sunk in little more than half a century to the depth of about seventy-three feet, displaying immense layers of timber, disposed horizontally, *stratum super stratum*. The uppermost trunks still exhibit bark in a state little altered, and their own substance completely ligneous. Beneath the wood appears more compacted together, and yet lower, the masses resemble jet or kennel coal.”

Here is most curiously opened to view the gradual transmutation of the vegetable to the mineral character. This fuel being highly impregnated with bitumen is disagreeable for domestic purposes, but is employed for burning limestone, and at an adjacent pottery.

The promontory of Torbay consists of marble, but the Breccia (hard red sand-rock intermixed

fine granite, composed of quartz, feldspath, and mica, in which, quartz seems to bear the largest proportion. If the micaceous part contains iron, it is not fit for the potter's purpose. The *Wha-she* of the Chinese is the steatite, or soap-rock, found in Cornwall. The *She-kan* is asserted to be gypsum. Asbestos is also said to enter into the composition of porcelain. Quartz in its purest state is sometimes substituted for *Petun-tse*.

with quartz of all shapes, sizes, and colours, and mostly angular) continues from the cliffs of Teignmouth along the coast nearly to Sidmouth. Here the surface is flinty, to the depth of two or three feet; but the cliffs are composed of a calcareous red sand-stone, with calcareous chrystals in the cavities.

“Hence eastward the surface is almost universally flinty up to Lymington.

“At Lime, in Dorsetshire, the cliffs are altogether calcareous, and masses of pure limestone, cast on shore by the waves, are collected and transported to the western extremity of the island and also to London, being excellent for setting in water.”

Chalky cliffs extend through Hampshire, with flint on the surface.

“The fine sand-stone of Portland is readily obtained. The harder and more durable sand-stone is procured in the isle of Purbeck, rising abruptly from the sea.”

Stonehenge was viewed with no ordinary interest. The mysterious origin, and surprising magnitude of the masses which constitute this edifice, not less than their peculiar arrangement, engaged more than a momentary attention. This monument had long been deemed by Dr. Withering, to Great Britain, what the Pyramids are to Egypt,—the antiquarian wonder of the land:—and this examination led to, perhaps, as plausible

a theory respecting it, as any which has been promulgated. It may be sufficient here to state in his own words :—

“ I take it for granted that Stonehenge is neither of Celtic nor Druidic origin. It is a structure by far too artificial for such barbarous people, and is the work of a much more enlightened nation, who were afterwards expelled or destroyed by those rude invaders from the north of Europe.”

After referring to various curious facts, to the monuments at Benares, “ the leading principle of which in structure and materials is the same,” and to the almost certainty of “ the existence of an Indian colony in the British islands ;” he, though with much diffidence, resolves the matter into the question,

“ Whether our great astronomical instrument was erected by the Phœnicians, or by the ancient Bramins their masters ?” *

* For further discussion of this subject, vide the ingenious correspondence of Dr. Withering with James Norris, Esq. of Nonsuch House, Wilts, whose letters evince a deep research into antiquarian lore.

Dr. Withering having little reason to recommend Lisbon as a situation likely to improve the condition of phthisical patients, the examination of each station along the coast for such a purpose became a primary object of his tour; and, as the subject cannot be too fully elucidated, no apology seems necessary for again adverting to it, by introducing the result of his own observations, together with the best information he could obtain.

His conclusions were,

That "the end of phthisical patients is hastened by removal to hot climates:

"That the natives of such climates, particularly of Portugal, are far from being exempt from *phthisis pulmonalis*; and that such cases are frequently sent to a still more southern latitude, as the Algarve, Setuval, or Cadiz."

"Where the *tendency is manifest, though the disease be not confirmed*, and Lisbon is to be tried, let the patient quit England in October, and return home, or remove to Cintra, about the month of April.

"Invalids should fix their residence in the country, and near the Tagus, for the convenience of fine sands, boating, and bathing.

"Lisbon itself is particularly objectionable, the higher parts being too much exposed, and the lower disgustingly dirty and oppressively hot.

“The higher part of Lisbon, according to Major Prætorius, averages two degrees colder than the lower part.

“To those patients who repaired to Lisbon, the sea voyage often proved more beneficial than the climate of Portugal;” but, alas, how few lived to return to England; and, of those, several survived not the following winter.

From the numerous cases which fell under the care of Dr. Withering in a long course of practice, it may be fairly inferred that, *cæteris paribus*, those who were restored to health by judicious attention to the incipient stage of the disorder, and by a timely removal to the most favourable parts of the coast of England, recovered as completely, and as promptly, as such might have done abroad; whilst to others, who had neglected to remove to a milder climate till reduced to an almost hopeless condition, Lisbon certainly accelerated the fatal termination.*

Among the miscellaneous papers following this Memoir, data will be found to prove, that in seeking a warm and sheltered situation, the relative

* Vide Observations on the Temperature, Climate, &c. of the South of Europe; with the Register of Consumptives who died at Lisbon.

advantage gained between the central part of England, and the most favourable points of the coast, is at least *four degrees* of temperature, whilst an advance to a latitude *five times* farther south, as Lisbon, would only insure about *four degrees more*.

Hence the increased ratio in the gradation of temperature between the centre of England and her southern shore, as compared with that coast and Lisbon, appears to be such, that the English invalide, by remaining in his own island, may gain in warmth of climate, by a journey of from *two to three hundred miles*, *one half* of what he would acquire by the additional hazard of a voyage of *as many thousands*.

After remarking on various English stations, the Doctor concludes:—

“ The *southern shore* of the *Isle of Wight*, protected from every ungenial blast by a range of almost perpendicular cliffs, affords a winter retreat preferable to any other spot in Britain. It is perfectly dry and warm, free from the Cornish damps,* and liable to no particular vicissitudes.”

* The proverbial Cornish mists do but too much extend over the south of Devon, some parts of which are also undesirably exposed to the east. The air is generally soft and balmy, and so far beneficial, but an extreme humidity detracts from its

Instances of recovery there effected might be adduced as truly surprising.

In thus strongly recommending the Isle of Wight, it should be well remarked that the opposite coasts of that island present a contrast of climate. Of all situations for pulmonic affections, the *Under Cliff* is the most eligible; the much-frequented bathing-places to the north and east, the least so.

That Dr. Withering intended to have presented his remarks to the public, appears by the following extract from a letter written only four months before his decease:—

“ I am meditating a publication for the amusement of the next winter, in which Devon, Cornwall, and Lisbon, will bear a conspicuous part. Indeed, it will be so miscellaneous that I cannot easily say what it may not contain.”

Brief as are the notices scattered through this work, they possess accuracy, and will not be accounted wholly insignificant.*

Dr. Withering having derived so little permanent advantage from foreign expeditions, resolved to venture the ensuing winter in England.

salubrity by relaxing the habit and impairing the digestive organs, especially of those who may not have been accustomed to it.

* Vide further Observations in the latter part of this volume.

His complaints were dyspnœa, with frequent inflammatory attacks upon the lungs, and repeated hæmoptoe. These distressing symptoms were mitigated by an artificial climate created in his spacious library. This apartment was furnished with double sashes, heated by flues, and regulated by a thermometer to the uniform temperature of sixty-five degrees. Every mode of gestation was necessarily avoided, as inducing fever proportionate to the exciting cause.

The aspect of politics was still discouraging, and nothing less than the demoralization of Europe appeared inevitable. Whilst the attention of almost every individual was devoted to these great events, Dr. Withering, retired within his own domestic employments, proved, as he himself states, that "the man whose voice is too feeble to be heard amidst such tumultuous ebullitions, may yet pass his time agreeably and usefully, by pursuing studies more within his reach, undisturbed by restless ambition, and untinctured by the gall of party spirit."

Although rendered incapable of general practice, he retained an undiminished interest for the advancement of his profession, and communicated to Dr. Beddoes "*a Letter on Phthisis pulmonalis*," which was published by that author, and which his biographer, Dr. Stock, pronounces to contain "several practical hints and reflections, which present a valuable commentary on a variety of passages in the 'Observations' of the former."

But the days of seclusion were chiefly occu-

pied in perfecting his botanical work; which, though a laborious undertaking, was not devoid of the most pleasing associations. The whole was to be new cast, and most of it written afresh. The language was made to approximate the Linnean, as far as the genius of the English tongue would admit, and much original matter, the result of actual experiments, was incorporated with the notes. More exactly to identify each plant, specimens were invariably supplied by correspondents, and no description was entered without having the subject before him. Hence resulted that degree of accuracy, which adds so materially to the value of the work.

Further to promote this design, Dr. Afzelius, Demonstrator of Botany at Upsal, while on a visit at Edgbaston, revised the whole of Dr. Withering's collections; and Sir Charles Peter Thunberg, the successor of Linnæus, obligingly forwarded specimens of nearly all the Swedish plants, respecting whose identity with their English brethren any doubts existed.

Thus did the study of Nature relieve many a painful hour. Botany in particular, according to his own eulogium; "Independent of its immediate use, is as healthful as it is innocent. It beguiles the tediousness of the road, furnishes amusement at every footstep of the solitary walk, and, above all, leads to pleasing reflections on the bounty, the wisdom, and the power of the great CREATOR."

1795.—“ With such amusement,” (Dr. Withering writes in the month of May,) “ confinement has not been tedious; and though we have seldom experienced a more severe, or protracted cold, I never passed through the trying season better since I became an invalide. My artificial climate perfectly answered its intention; and I am now got about again with the swallows, in considerably better health than I have known at this season for the last three years.”

The succeeding months were attended with some phenomena, which are thus described by the Doctor.

“ After a tempest of wind which tore up by the roots nine large oak and lime trees in the park at Edgbaston, on the 18th of November occurred the strongest earthquake that had happened for a long time in this island.

“ The morning of that day had been a continued hurricane, which in the afternoon abated, and the weather became pleasant, and was succeeded by a calm in the evening. The barometer was very low. At fifty-five minutes past ten o'clock, p. m. the earthquake commenced. The first motion was a heaving which continued five or six seconds, the heaving being repeated about thrice in two seconds. These were instantly followed by a strong vibratory motion, which did not last more than one second. The vibrations were very rapid. No noise was perceptible during the heavings, but during the vibration the noise was very great, though probably not more

than must have been produced by a shock given to such a mass of building, and the furniture it contained. My personal sensations during the vibrations were precisely similar to those experienced by the rider of a horse shaking himself under him ; not less rapid, nor less violent."

It appears from the registers of that period that this convulsion of nature was felt in various parts of England. It was, however, confined to this island, its direction being limited to a narrow line nearly due north and south, and originating in Derbyshire.

1796.—The early part of the winter was so unusually mild, that during the greater portion of January the thermometer indicated fifty-five, and was seldom lower than forty-five degrees ; and a curious fact is recorded by Dr. Withering, strongly indicative of our uncertain climate, that on Christmas Eve (1795) the temperature of the air was actually higher than it had been at the same hour on the preceding Midsummer-day.

This extraordinary mildness produced a temporary revival, which enabled the Doctor thus to report of himself:—

" Your solicitude about my health is very flattering, and your unceasing friendship certainly entitles you to the best information respecting

it; but it is so long since I have been well, that I sometimes forget that I am otherwise. I am reconciled to my fate, whatever it may be, and enjoy existence in my present state more than many would suppose.

“At times an exacerbation of feverish and inflammatory attacks on my lungs, unhinges me entirely for a week or two. That organ has suffered so much from former exposures and inattentions, that its functions can only be restored to a certain degree; and in this better state I am more than comfortable, I am happy; and though not so actively useful to mankind as heretofore, I am still busy, and I hope to some good purpose.”

We cannot but admire this exemplary instance, not merely of patient, but cheerful resignation; and had his irremediable infirmities subjected him to still severer trials, doubtless he would have borne them with becoming fortitude.

Thus does he address a friend almost sinking under complicated ills:—

“To encourage a desire to die, is an unworthy tendency to desert the post allotted us; and if such desires once become motives to make us neglect the means of restoring or preserving health; such motives and such conduct, directly or indirectly tending to cut short our existence, are, perhaps, altogether as indefensible and as wicked, as the still shorter modes of the pistol or the halter.”

Notwithstanding the many ill omens with which he was beset, he indulged a degree of

hope in regard to the progress of his own amendment, which he would scarcely have admitted in that of another.

In respect to his Botanical labours he states; "I have now for nearly two years been occupied, upon an average, not less than from six to eight hours a day on this work, and it will be yet about six weeks longer in hand. I know not whether it will be a '*monumentum ære perennius*,' but I do know that I could have made a brazen monument as large as the Colossus in a shorter time."

Nothing less than such perseverance could have brought fourth the *third edition* of the "*Arrangement of British Plants*," comprising one entirely new volume, so early as the close of the year 1796.

"Exclusive of minor improvements, among the most striking," says the author, "may be mentioned the abolition of the Classes Gynandria, Monœcia, Dioecia, and Polygamia. The plants heretofore arranged under them, are incorporated in the other classes, according to the number and situation of the parts of fructification."

This innovation in the original distribution of the learned Swede, was not adopted without the approbation of his distinguished successor, and is allowed to facilitate and simplify the process of investigation. The lamented Dr. Sibthorpe had prepared his "*Flora Oxoniensis*" on the same principle, and the greater number of prac-

tical Botanists concurred in opinion that the alteration was a very useful and convenient one.

Dr. Withering himself states, "By the advice of Sir Charles Peter Thunberg, (who has set the example in his "*Flora Japonica*," and from whom I learn that the alteration would have been made by Linnæus himself had he lived longer,) these classes are expunged from the vegetable system, and the order Monogamia from the Syngenesia class.

"The Carexes, therefore, now fall into Triandria, next to the Scirpus, Schœnus, &c.; the Orchidiæ into Diandria; the Violæ into Pentandria; and the Atriplex associates with its brethren the Chenopodia.

"The great alterations and improvements in the generic descriptions, and in the specific characters, lately made, as well as the changes in the language, compelled me to re-translate all that is taken from Linnæus. The long and minute descriptions of species are greatly curtailed, and only such parts retained as from a careful and close attention to the different species, form contrasts to each other; thus forcibly increasing, and pointing out, the specific distinctions."

"The first volume," observe the reviewers, "comprises in itself a complete *Genera Plantarum*; an important improvement, constituting a very useful, and almost independent work."

They conclude their critique in the following terms. "In large and laborious works errors

must happen, and ought to be treated with candour. It bears most evident marks of uncommon labour, great diligence, and extensive knowledge. Infinitely superior to every thing which has gone before it, we recommend it to our own countrymen, as approximating more nearly to a complete work, than any thing yet published in the way of a British Flora. We recommend it to foreigners* also, as an excellent exemplification of a true Systematic Flora, as a full illustration of the articles enumerated, and, (with the honest pride of Englishmen,) as a noble catalogue of the productions of Great Britain."†

Of private commendations his correspondents were lavish. Of these none can be supposed a more competent judge than Dr. Pulteney, who thus sums up a strict examination of the work.

"I am amazed at the industry and skill you have exhibited in this work; and congratulate you on the fame and character it must give you with all who are true judges of its merit."

Dr. Withering felt, as his own sportive language expresses, that "by two years absence in Portugal, and two years close application to

* A learned foreigner (after alluding to other eminent characters) passes the following encomium; "Non inferior est GULIELMUS WITHERING, cujus liber, tertia demum editio, quæ 1796 tomis quatuor prodiit, *insigni commendatione dignus fuit.*" Curtii Sprengel, "Hist. Rei Herbariæ," tom. ii. lib. vii. cap. 4.

† Monthly Review.

Botany, he was quite thrown out in the pursuits of Chymistry and Mineralogy ; but, as the chase had not been urged very rapidly, he was not without hopes of overtaking it."

Long unaccustomed to contemplate Chymical subjects in the general, he scarcely felt himself possessed of any predominant opinion respecting the new theories ; much less did he pretend to decide upon their respective merits ; though he for a while remained incredulous as to the decomposition of water.

It were now unseasonable to recapitulate his own peculiar notions, against some of which facts subsequently established unquestionably militate ; though, were proofs wanting of an ingenious mind, as such they would readily be admissible.

The favourite doctrine of Phlogiston itself has since been exploded ; though for several years it continued to preserve a dubious existence, among certain philosophers of the old school. It would appear that the Doctor had abandoned it as untenable, having presented to his friends of the Lunar Society, at one of their social meetings, a humorous piece in verse, entitled, "*The Life and Death of Phlogiston*," which may still be recollected for its pointed wit, by the few surviving members.

Although the winter of 1796-7 was not on the whole remarkable for severity, it may be worthy of notice that at sun-rise on Christmas-day the

thermometer, at Edgbaston, indicated seven and one-half degrees ; and at the same time at Croydon, in Surrey, it fell five and one-half degrees below the zero ; “ which,” Dr. Withering adds, “ I believe to be a greater cold than any that has been hitherto registered in the southern part of this island.”

1797.—The precarious remnant of the Doctor's days was embittered by an increase of suffering and privation. The position of writing became, at times, oppressive, if not wholly inadmissible ; and his powers of conversation were much limited by a distressing dyspnœa.

His situation will be best described by a few extracts from his own letters. Soon after the commencement of the year, he thus addresses an intimate friend :—

“ With that hope, which like a coy coquette, for ever courts, yet for ever eludes our grasp, I look forward to the genial days of spring with high expectation. Such expectations are pleasing at the moment ; if realized they do not lessen the enjoyment of the reality ; if not, to a mind accustomed to contemplate uncertainty, it can hardly be called a disappointment.”

And having passed through the brighter months with but little perceptible amendment ; still cher-

ishing that buoyancy of expectation which is too often symptomatic of fatal disease, he reports of himself to one from whom he anticipated an early visit:—

“ My strength has of late advanced faster, my appetite and sleep are improved, though I regret the loss of a summer—a loss which to me is irreparable. But I have much remaining for which to be thankful. I can begin to amuse myself, and can bear short rides tolerably well. Still, however, you will find me reduced, short-breathed, not free from cough, consequently incapable of exertion; but you will not see me either fretful or dispirited, and exemption from such evils is a positive blessing.”

With this transient revival, he appeared to feel a renewed interest in the important events in which his country was involved. At one gloomy period he had almost become an alarmist; dreading lest the pressure of continued war should endanger the Constitution he so ardently admired.

In general he professed himself an optimist, freely encouraging the more cheerful prospects, so happily expressed by the learned and excellent Sir J. Eardley Wilmot, who foresaw nothing but “ a few dark clouds, which are always flying under the bright azure sky of all free governments, and rather tend to purify the air than corrupt it.”

He allowed the then ministers great merit in

rousing the spirit and calling into action the force of the country, and promoted in his own parish the voluntary contributions for the public service; respecting which, he says, " though, as a war fund, I am fully aware they will do but little, yet, judging from the universality of the measure, it will produce a good effect upon our enemies, and cannot have a bad one on our friends. Thus armed, and almost unanimously determined to resist an invading foe, I feel relieved from such an apprehension."

No one deserved a reputation for genuine patriotism more than did Dr. Withering. However jealous he might be, under ordinary circumstances, of any encroachment on the liberties of the subject, he felt that in the hour of danger, the birth-right of Englishmen was only to be preserved by an unequivocal adherence to the legitimate government. He deprecated the pernicious politics of those pseudo-patriots, who, rather than desist from their endeavours to embarrass an existing administration, would hazard the best interests of their country.

With a just feeling of exultation at this momentous crisis, he thus conveys his sentiments to a foreign correspondent.

" No;" he exclaims; " we are in a high state of unanimity and preparation, determined not to exchange sterling English liberty for French; because, though of late clipped a little, we know it to be standard."

And again, "The cheerful support of every measure of government is now much more general than I ever remember it; as is also the confidence of government in the people. The rulers have intrusted them with arms; and they, in return, conform most willingly to the necessities of the commonwealth.

"The well-meaning reformists are convinced, by actual experiment, that society is yet too corrupt to admit of a perfect and enlightened policy; and the horrid villains of France have blighted the rising hopes of the philosophic philanthropist."

To another he writes, "Scientific matters are partly at a stand with us, almost every active man being enrolled in some form or other of military duty. We no longer fear invasion, the spirit of resistance being as universal as it is animated; and however much some of us may be aware of the necessity of certain constitutional reforms, we all seem determined to reject the interference of our neighbours; and if at length destined to submit to arbitrary power, rather to prefer the despotism of one man, whose hereditary rights involve his interests with our own, than to be harassed by the tyrannical arts of a short-lived Directory, who have no permanent concern in the welfare of the community, sufficient to check their own propensities to plunder and oppression."

In the ardour of youth, espousing the senti-

ments of Raynal and Macauley, Dr. Withering's opinions were tinctured with that republican bias, so frequently concomitant to the most manly and energetic characters; till a more mature judgement convinced his understanding, that democracy must ever be inapplicable to great states, ephemeral in duration, a chimera in politics. Every numerous society must necessarily have a head; and so long as the powers of the human mind shall be found infinitely to vary, talents, stimulated by ambition, will assume the supremacy, whether in the garb of an Archon, a Dictator, a King, or a President.

1798.—The severe winter was most unpropitious to the invalide; nevertheless, that "*vivida vis animi*," which is the soul of all exertion, remained unextinguished, and, far from repining, he felt grateful for the resources still permitted him.

1799.—During the following summer Dr. Withering was engaged in directing the enlargement and other improvements of a house he had lately purchased, situated to the south-east of Birmingham, where formerly stood the ill-fated residence of Dr. Priestley.

Long impressed with the idea, that the elevated and exposed situation of Edgbaston was injurious to his constitution; he became sensible, though, alas! too late, that the sense of picturesque beauty must be sacrificed to more essential comfort. Yet he could not without regret relinquish so favourite a spot; but the hilly and uneven nature of the grounds no longer suited him, and, according to his own expression, he "looked for some advantages in a soil equally dry, an air as pure, fields, whose level surface, and walks, whose sheltered protection, might allow him to traverse them at almost every season."

The fatigue unavoidably incurred in accomplishing this purpose, might possibly in itself have been borne, attended as it was by a pleasing anticipation; but, unhappily, at the same time, he was enduring extreme anxiety from the alarming indisposition of Mrs. Withering.

"This sudden and most unexpected seizure," he observes, "threw me into a state of hurry and agitation, a kind of *febricula*, which the succeeding hot weather did not suffer to subside."

We have traced the progress of Dr. Withering's ill health through nearly twenty years, till now the season approached, when his delicate frame

could no longer sustain its infirmities. In respect to his own case, he considered that the predisposing cause of so much illness was attributable to an imprudent exertion made many years before, when one of the main arteries became enlarged; the precise situation of which injury he was enabled to point out. He was immediately after the accident seized with peripneumony, accompanied with symptoms which, in his judgment, indicated organic disease.

The closing scene offers nothing inconsistent with what has been already described. That period which finally stamps the reputation of man; until which, according to Solon, no one should be pronounced happy or miserable, need not in this instance, dread the severest test of the Athenian sage.

As he had on all common occasions displayed the *suaviter in modo*, so on each emergency did he prove himself possessed of the *fortiter in re*: a gentleness of manner engaging affection, combined with a firmness of mind which served him in every extremity.

In one of the last acute attacks of pleurisy, about eleven o'clock at night, on the 5th of July, his surgeon being absent, taking the lancet in his own hand, he performed on himself the operation of venesection with great composure and dexterity.

The desire to repair to a more sheltered spot, increased with the diminished probability of

benefit from it, and he informed the agent of Lord Calthorpe of his intention, according to his own expression, not to pass another winter at Edgbaston "unless it were in consecrated ground."

His removal to the Larches was with much hazard effected on the twenty-eighth of September. The circumstances of thus taking possession were rendered peculiarly melancholy by the inability of Mrs. Withering to accompany him. She parted from him under the grievous impression that she should see him no more in this world; though he continued to indulge an expectation of being shortly able to receive her at his new habitation.

Whilst still down stairs, he was prevailed on to give his advice to a young person brought by Lady S——; the last patient he attempted to see, and for whom he wrote his last regular prescription.

On Wednesday, the 2d of October, the disease seemed to threaten such speedy fatality, that his son was compelled to quit the more lingering malady of his mother, to attend almost entirely on the other sufferer. At this juncture arrived the venerable Lord T——, with an introduction which the Doctor could not altogether neglect, though confined to that bed from which he never arose. The much sought-after physician once more took his pen in hand, and with extreme difficulty made a few general notes of a plan of

treatment; by this act closing his career of medical practice.

As in previous sickness he had been gratified by frequent visits from his brethren in each department of the profession, so now was he sedulously attended: himself becoming a most willing and tractable patient, passively submitting to the suggestions of those in whom he had reason to confide.

On the following night it was found necessary to bring into the sick chamber a waiting man, when an affecting proof of attachment occurred. The faithful domestic, on beholding the traits of death unequivocally depicted in the countenance of his master, instantly swooned away on the floor. The Doctor, with renewed animation, ordered the means to be used for his revival.

On Thursday some of the more painful symptoms subsided, but not in such a way as to afford any well-grounded hope of real amendment. In every interval of moderated pain, he became inquisitive for public news, and felt the throb of patriotism strong in death.

Extreme debility and high fever induced a degree of delirium for a few hours; which was but too perceptible to himself. Endeavours to arrest the wandering attention by reading and conversation were not unsuccessful, and on the balance being restored, he returned hearty thanks to God for the divine gift of reason, fervently praying, that however suffering in body, his mind might be preserved unshaken.

Towards evening on the fifth, his nearly widowed wife was conveyed to that residence, which had been contemplated as the abode of comfort—of happiness. Having warmly recommended the mother to the tender consideration of her children, and suggested such remedies as were most applicable to her disorder, he appeared desirous, as far as possible, to prevent the intrusion of thoughts so afflictive, and so likely to disturb his equanimity. He probably foresaw that his own inevitable doom, would hasten that event which did so soon follow.

In other illnesses he had found it expedient, in order to relieve the accumulation on the lungs, to undergo the tormenting discipline of being awakened at short intervals, sometimes every half-hour; an interruption inconceivably distressing, both to himself, and the attendant obliged to perform the irksome duty. Such was the plan now necessarily pursued; and severe as was the trial, his patient enduring continued without a murmur.

Early in the morning of Sunday, the 6th of October, when every ray of earthly hope had vanished, Dr. Withering evinced an entire confidence in the goodness of an over-ruling Providence, tempered with a pious resignation to his will. No clouds, nor darkness gathered round his exit; the opening prospect of futurity shed a serene effulgence over his latest hours.

Composed and tranquil in himself, he reproved the appearance of grief, or what he termed

unmanly sorrow, which could not altogether be restrained.

About six o'clock he intreated for two hours of undisturbed repose; but, alas! even sleep no longer brought refreshment: for life itself was fast ebbing away. Nevertheless, through the whole forenoon, he engaged in a series of conversations on the most interesting topics. Even his voice in those impressive discourses resumed its natural firmness, enabling him to descant with the utmost elevation of soul on the truth of that Revelation, and of those doctrines, which he had adopted from conviction, and cherished as the source of his highest expectations. He experienced their consoling influence in this awful moment, and whilst praising and magnifying the Lord, his features were illumined with the ardent desire of a speedy translation to those realms, where pain and sorrow are no more.

If one lingering look was cast behind, it arose from an anxiety to be assured that those nearest and dearest to him were equally impressed with that lively faith, the efficacy of which he now doubly felt.

On his son and daughter, by his own desire, again drawing near to him in the afternoon, as if to reconcile them to the approaching separation, with a calm and beaming countenance, "My children," he said, "see how easy I lie!"

Dr. Withering had never indulged in that carelessness of personal appearance sometimes ob-

servable in the studious. Indeed, he attached so much regard to neatness, as to consider it, in a degree, at least, to the body what virtue is to the soul: nor did propriety of this kind escape his attention even at the point of death. Refreshed by an entire renewal of linen, and, perhaps, with a sense of decorum gratified, immediately afterwards, being raised at his own request, he fervently ejaculated, "Now I am ready!" at the same moment springing forward with an energy that might be deemed almost preternatural, he exhausted the feeble remains of vitality.

Such was the expiring effort—such the last movement of this excellent man. - - - - -

Improbable as it were that he who had been the advocate of Christianity, because esteemed a liberal philosopher, should, in the last extremity, halt between two opinions, and when about to deliver his account, sealed, to the great Judge of the Universe, renounce the sure guide to his best hopes; misrepresentation and groundless surmises have rendered a detail of facts necessary.

How many, even of the champions of infidelity, have, on their death-beds, bitterly repented their sophistry and metaphysical scepticism. It has been justly observed that atheism and infidelity do not bind up the senses of men so strongly

but that they may be awakened by the apprehension of death, or some great calamity coming upon them.

But with Dr. Withering no recantation was necessary. He affords another instance of a learned, unprejudiced, and sensible man, voluntarily, but not without examination, subscribing to opinions previously supported by many profound philosophers:—in our own country, by a Newton, a Locke, a Bacon, a Boyle, a Milton, that excellent judge of evidence, Sir Matthew Hale, and more recently, though not less to the purpose, (from the peculiar facility of investigation which he possessed, as connected with oriental literature, and of which he fully availed himself,) Sir William Jones.

These eminent persons espoused a system of religion which has flourished most in the midst of intellectual light, and which, in the beautiful language of Mercier, “ by the first act of life, baptism, on our entrance into this world, welcomes us to her bosom ; and, in early youth, when the tide of passion bears away our fragile bark, aids us in wrestling against the tempest, and offers herself as a steady pilot to guide us to a peaceful haven. It is she who presides at the most interesting act of life, and insures us the possession of the cherished object of our souls ; it is she that softens our pains, that fortifies our yielding spirits, pours the balm of consolation on our woes, enables us to endure wrongs, and, yet more, engages us to forgive them : it is she that receives our last sigh,

assists at the last sad rites which are paid our memory, that consigns our remains to the tomb, and, as if all these kind offices were insufficient, ascends to heaven interceding for us with Divine Mercy."

Dr. Withering had himself directed the unostentatious manner in which his interment should be conducted. Accordingly, with the customary clerical and medical attendants, his remains were, on the 10th of October, conveyed to Edgbaston, and deposited in a vault beneath the church by six honest peasants, chiefly those who had been employed by the family whilst resident in that parish. The funeral solemnities were impressively performed amidst a deeply-affected assemblage of persons, who, uninvited, thus paid their tribute of respect for the deceased. Over this grave the Clergyman and the Dissenting-minister mingled their tears, and together offered up their devout aspirations.

Nor should another incident be omitted, for a stronger proof of the veneration in which Dr. Withering was held can scarcely be imagined than that afforded by two of his patients in humble life, who, soon afterwards, sunk under disease not very dissimilar to his own. These worthy persons, unconnected with each other, but impelled by the same feeling, resolved to be laid in the lap of

earth near to their benefactor, incurring the additional expense of extra-parochial burial, and an inconvenient removal, to attain this their last desire.

Others, in no degree related, appeared in mourning; and, without any violation of truth, may it be said,

"Multis ille quidem flebilis occidit!"

Merely to eulogize has been far from the intention of the editor; "*de mortuis nil nisi BONUM*," though a maxim derived from a generous principle, will, in many cases, be found more specious than just, and often incompatible with that truth of exemplification on which biographical merit principally depends. In proportion as the picture boldly approaches the original, or weakly deviates, even from amiable motives, into fiction, so will be judged the value or insignificance of every such performance.

In the present undertaking "*de mortuis nil nisi VERUM*," has been attempted; but in deducing a general character from the particulars here recorded, rather than trust to feelings which might betray the writer into extravagance, it may be more prudent to submit a few anonymous, or perfectly disinterested sketches.

The "General Biography"* contains the following faithful outline.

"In the intellectual character of Dr. Withering was joined persevering application with sagacity and discernment, which eminently fitted him for scientific researches. In his medical practice he limited prescription to what he considered as absolutely necessary for his patients, and any dislike he might incur from the inferior branches of the profession on that account, must be regarded as a testimony in his favour. His disposition was mild and humane, and a natural reserve did not prevent him from enjoying rational society."

An unknown author thus concludes :—

"As a philosopher he was active in inquiry, profound in research, and minute in investigation; as a physician he was acute, attentive, discerning, and humane.

"But his professional celebrity is not circumscribed within the narrow limits of his own country: his name is known wherever medicine is practised as an art or cultivated as a science, and his writings will deliver it with honour to posterity; whilst his domestic and social virtues will long live in the memory of his friends."

Shortly after his decease appeared from the pen of an entire stranger,† resident in a distant part of England, the following complimentary

* Vol. x. 4to.

† J. Crane, M.D. of Crewkerne.

lines ; the more gratifying as equally spontaneous and unexpected.

“ Deep in the earth, the debt of nature paid,
The mortal part of WITHERING is laid ;
And though he seem to share the common lot,
Of those who perish, and are soon forgot,
His fame will never die ! each future age,
Instructed by the labours of his page,
(The faithful page where Nature stands to view,
Displayed in colours ever bright and new,)
Shall hail his honoured name with grateful praise,
And bards his skill record in tuneful lays :
Of Wealth or Power short is the transient state,
Whilst SCIENCE soars above the reach of Fate !”*

In person Dr. Withering was somewhat above the middle stature, and, till bowed down by ill health, might have been termed rather robust than otherwise. His countenance was strongly indicative of good sense ; his eyes expressive of intelligence, and occasionally displaying an irresistible penetration, mingled with authority. His features were regular, but too frequently suffused with the hectic flush of life-consuming disease.

The print annexed to this volume is copied from a fine portrait by Charles Frederick von

* Other notices, similar in effect, may be found in the Magazines, in the “ Annals of Medicine,” &c.

Breda, a foreign artist who visited Edgbaston in 1792. An old college associate of the Doctor has borne the following affectionate testimony to the fidelity of the resemblance.

“ I have given it an honourable station in my library ; it is placed as a central print* over the chimney piece, where I contemplate it with pleasure many times in a day, but particularly whilst I am smoking my pipe in an evening. I am the more pleased with it, because, besides being an elegant print, it is so exact a likeness of my late friend that I can at times imagine I am conversing with him, and often renew in fancy our philosophical evenings, when I with my pipe, and he with a snuff-box in his hand, were as happy for two or three hours as friendship, retirement, and science could make us.

“ Those days are never to return ! but they are delightful in the recollection ; and will, no doubt, in a better world, be replaced by higher affections, more refined conversations, and more sublime subjects of inquiry. What is past has been but the infancy of our friendship ; it will hereafter be renewed with improved interest, and advance at length to maturity !”

Dr. Withering's hand-writing was never hurried into illegibility, but always neat ; as may be judged from the *fac simile* of a medium specimen.

* A larger engraving from the same picture.

A mural monument has been erected in the church at Edgbaston, the entablature of which is of black marble, enriched at its base with the emblems of the Æsculapian art, from which extend on the right a representation of the *DIGITALIS purpurea*, (Purple Foxglove,) chiseled from living specimens, and on the left the *WITHERINGIA solanacea*. The whole is surmounted by a Grecian vase, entwined with a chaplet of natural flowers. These decorations, delicately executed in pure statuary, embrace a tablet bearing the following inscription.

Sacred to the Memory
of

WILLIAM WITHERING, M.D. F.R.S.

&c. &c. &c.

who was born March 28, 1741,

and died October 6, 1799,

aged 58 years.

While heav'n-born Genius drops on earth a tear,
And Science, drooping, mourns o'er Withering's bier;
While Pity sighs to find that bosom cold,
Where late she reign'd, dispensing good untold;
While Memory's voice, each virtue telling o'er,
But deeper wounds the peace she would restore,
Hope smiles serene,—her eye upturn'd to Heav'n
Where Virtue's never-fading crown is giv'n,
Sheds o'er the weeping sorrowers below
That calm a Christian's grief alone can know.
Yes! on that day, when Nature's ruin'd frame
Shall form a grave for each illustrious name,

And Science' star, on earth so seeming bright,
Shall be eclips'd in universal light,
Then shall the sainted sage that bliss receive,
Which here no tongue can paint, no heart conceive,
While Angel choirs, with plaudits justly giv'n,
Proclaim his triumph to the hosts of Heav'n.

*An Enumeration of the Works of WILLIAM
WITHERING, M.D. F.R.S. in the Order of
Publication.*

“ *Dissertatio Inauguralis de Angina Gangrænosa.*”—1766.

“ *A Botanical Arrangement of all the Vegetables naturally growing in Great Britain, with an Easy Introduction to the Study of Botany.*”
2 vol. 8vo. 1766.

“ *An Account of the Scarlet Fever and Sore Throat, or Scarlatina Anginosa, with Remarks on the Nature and Cure of that Disorder.*”—1778.

“ *Outlines of Mineralogy, translated from the Original of Sir Torbern Bergman; with Notes by the Editor.*”—1783.

“ *An Account of the Foxglove, and some of its Medical Uses; with practical Remarks on Dropsy and other Diseases.*”—1785.

“ *A Botanical Arrangement of British Plants, including the Uses of each Species in Medicine, Diet, Rural Economy, and the Arts.*”—1787.
To this edition was added,

A third volume in 1792.

“ *An Account of the Scarlet Fever and Sore Throat, or Scarlatina Anginosa; a new edition, to which is prefixed an additional Chapter on the*

Nature and Cure of the Ulcerated Sore Throat."
—1793.

" A Chymical Analysis of the Water at Caldas da Rainha, in Portugal."—1795.

" An Arrangement of British Plants, &c." the third (double) edition, extended to four volumes, 8vo. 1796.*

*In the Transactions of the Royal Society of
London :—*

" Experiments on different Kinds of Marl found in Staffordshire."—1773.

" An Analysis of Two Mineral Substances, viz. the Rowley Rag-Stone and the Toad-Stone."—1782.

" A Letter to Joseph Priestley, LL.D. on the Principle of Acidity, the Decomposition of Water," &c.—1782.

" Experiments and Observations on the Terra Ponderosa."—1784.

" An Account of some Extraordinary Effects of Lightning."—1790.

* Of this work three large impressions, each with considerable additions, have been published since the death of the author.

In the Transactions of the Linnean Society:—

“ A Method of preserving Fungi, ascertained by Chymical Experiments.”—1792.

In Dr. Fowler’s “ Reports on the Effects of Arsenic.”

“ A Letter on the Arsenical Solution.”—1786.

In Dr. Beddoes’s “ Observations on Phthisis Pulmonalis.”

“ A Letter on Pulmonary Consumption.”—1793.

In the “ Annals of Medicine.”

“ An Account of a convenient Method of inhaling the Vapour of Volatile Substances.”—1798.

END OF THE MEMOIR.

*Correspondence between Dr. WITHERING and
JAMES NORRIS, Esq. of Nonsuch-House, Wilts,
respecting STONEHENGE.*

*Extract of a Letter from Dr. WITHERING to
JAMES NORRIS, Esq.*

" February 4th, 1797.

" DEAR SIR,

" I begin upon a large sheet, foreseeing that the varied and interesting subjects of your last letter, will require more animadversions than a common size would contain.

" You will probably have visited Stonehenge since the late downfall, to examine what lichens have grown upon the upper parts of those stones which have been out of the ordinary reach of man for so many thousand years, and if you find any rare species, I hope you will have the goodness to remember me.

“ You will, doubtless, be attentive to any disclosure which this overthrow may have effected. I could almost curse the unfeeling hand which caused the ruin of this stupendous work of the most remote antiquity. To dig for discovery was allowable, but not to replace the soil was shameful. If the story of the tin plate be true, it is clear that the inscription could not be in Greek characters, consequently not British, for Cæsar tells us the Britons used the Greek characters when they wrote.

“ I am disposed to think Stonehenge of a much older date, and the work of a much more enlightened people than our British ancestors. The Saxons called it Stonehenge, the Britons Choir-Gaur and Menambres, all which are descriptive, not appropriate names, the two latter signifying a superb or magnificent stone-work. I believe, therefore, that both these people were equally ignorant of its origin and design. As it has fallen so very lately, let me beg you, when you visit it, to be particularly attentive to the shape of the tenons in the uprights, and the mortises in the cross piece, and to measure them with great exactness. They are probably now quite perfect, and though somewhat like the section of a sphere, perhaps that is not their real figure. Men who first made tenons and mortises, would naturally make the former a cylinder or a parallelopipedon; they would hardly think of a segment of a sphere, but perhaps the real shape of these will demonstrate a much higher degree of mathematical

knowledge. I regret not having visited the monuments at Abury; but, perhaps, you can tell me whether the cross stones there are mortised in the same manner, or only simply laid on the uprights. If the former, I shall be disposed to rob our rude Celtic ancestors of the credit of that labour, as I do of the erection of the cromlech, for this word (I believe) simply signifies a heap of stones, and is therefore by no means a name likely to be imposed by the authors of such monuments. I allow the Druids the loggin-stone; at least the use they made of it, its name being strictly the *oracular* stone.

“ I quite agree in the opinion that the materials of Stonehenge have been selected and brought from the Grey Wethers. Is it true that one of these stones with its tenon, (or mortise, I know not which,) ready formed, has been left on the road, and still lies in the water at Fighelden? I know your description of these stony masses to be just; they are what I would call a granulated quartz. Having no proper tool, I could not bring away a piece, as I wished to have done, in order to decide whether the particles are only firmly impacted together, or conglutinated by a cement of the same nature. You will readily determine this point by slowly heating a piece to a full red heat, and slowly cooling it. If the granules are not cemented, this piece will then readily be broken down. Are you not under a deception about its imbibing water? If you weigh a fresh broken piece, suppose of two or three ounces,

and then weigh it again after it has imbibed all the water that it can, you will ascertain the matter. Should it prove that it does imbibe a quantity of water, it will be difficult to say why it is not torn to pieces when the action of frost comes upon it in its wet state. We may yet have sufficient frost to allow of this experiment also. Granulated quartz has hitherto been mentioned by mineralogists as found only in detached masses; but a mountain* of it exists within five miles of this place.

“ I ought to apologize for writing so diffusely on these subjects, and acknowledge a degree of enthusiasm when thinking about Stonehenge, and other *real antiques* of our country; for all my inquiries are directed to an earlier period than the invasion of Julius Cæsar; but I suspect you are not devoid of the same spirit, and if so you will readily forgive me.

“ When at Edgbaston I asked you about certain lands in Dorset and Wilts laid out in a kind of terraces, one above another, like the seats in a theatre. In the “Gentleman’s Magazine” for October, they are very justly and extremely well described in a well written paper of inquiry. The author refutes with ease the common opinions of their formation, but scarcely offers any of his own. The provincial name, he says, is ‘*lynchets*.’ Where they range along the sloping sides of a small valley, particularly if that valley be closed at

* The Lickey-hills, in Worcestershire.—EDITOR.

one end, they have much the appearance of an immense amphitheatre, and I believe that some of our antiquarians have described and figured them as such.

" I remain, dear sir,

" Your obliged friend,

" W. WITHERING."

P.S.—" The large blackish flat stone lying before the great trilithon at Stonehenge, and called the altar-piece, is said to be marble, which it certainly is not. I could not break off a piece for examination, but thought it most like a black basalt. Do you know what it is, and can you guess from whence it came?"

JAMES NORRIS, *Esq. to Dr. WITHERING.*

" Nonsuch-House, May 6th, 1797.

" DEAR SIR,

" I blush at the recollection of your long unanswered letter, so agreeably blending together the pursuits of nature and antiquities; pursuits, that are alike congenial with my mind, and which, to dwell upon, needs not the offering of apology. You seem to suspect me not destitute of some affection towards the remains of antiquity; indeed I am not, and only wish my skill did but equal my regard.

" The name of Stonehenge has been dear to

me from childhood ; and much do I lament that our age has the ungrateful task of recording the downfall of part of that fabric, which is the pride of Wiltshire and of Britain. Soon after the accident, I felt a desire of beholding the change it had sustained ; but the shortness of the days, and the unsettled state of the weather, pleaded for a delay. Your stimulating letter of the 4th of February, greatly served ' to whet my almost blunted purpose ;' but, deaf also to the immediate voice of this, I was induced to wait until the returning spring should, by lengthening and improving the days, afford a more pleasing leisure, after a twenty miles ride, to indulge my fondness for this stupendous work, even to satiety. At length I have attained my object, by setting out a few days since ; provided with a foot measure, a hammer, and some aqua-fortis, to try that from which I might not be able to obtain fragments ; much wishing your company, to share with me the pleasure of the inspection.

“ The recent dilapidation consists of the three stones, composing the great trilithon, on the north-west end of the altar ; which have fallen prostrate outwards, in a north-western direction, without any fracture to themselves or their neighbours. I regret that the awful grandeur of the place has hereby suffered from the loss of that gloom which so much exalted it ; as the increased admission of light, to the central parts is very great. The two pillars still preserve their paral-

lelism, and appear to have been sunk not more than four or five feet beneath the surface of the earth; the transom stone which they supported, lies separated from them, not more than to allow of a convenient examination, with its under side a little reclined upwards. The pillars have each one tenon, near the middle of the areas of their tops; in form, certainly not that of a cylinder, nor paralleliped, but nearly hemispherical, and a little campanulated at their origin. The two mortises, in the transom, are more capacious than what the tenons would properly occupy; and, though not mathematically accurate, their concavities seem more nearly to coincide with the segment of a sphere, or rather of an oblong spheroid, than any other figure; but not, like the tenons, at all campanulated at the verge. They differ in dimensions, as follows—the larger mortise, one foot nine inches in diameter at the edge, and one foot in depth; the smaller mortise, one foot six inches diameter at the edge, and nine inches deep, and more eccentric and less regular than the larger one. The cavities are separated by an interval of nine feet and a half in the clear, and smoothly wrought; and the whole under surface of the transom, and tops of the pillars, are regularly planed by the tool. The tenons appear to equal each other in size and shape, without any respect or proportion to the difference of the mortises. I could not perceive any traces of what might be deemed characters, on

the parts thus recently exposed to view ; nor any thing peculiar in the foundation-soil so newly laid open.

“ I made many inquiries about the cause of this overthrow ; and, from the unanimous opinion of the inhabitants of Ambresbury and the shepherds of the plain, I find the immediate cause to have been the sudden thaw, after so intense a frost. But as the equally trying season of January, 1795, and many other years, had been sustained without injury, I am inclined to look for a predisposing cause, in a small colony of rabbits, which the shepherds say, have sometimes frequented this spot, and dwelt beneath many of the stones, though not, to their knowledge, under the late ruins. It is some satisfaction to learn, that man stands exempted from any charge, unless it be that of omission, in not extirpating these little underminers ; but their destructive tendency being hitherto unheeded because unwitnessed, may excuse the slumbers of that watchful solicitude, which I hope will ever be in future awake to the preservation of our venerable antiquity.

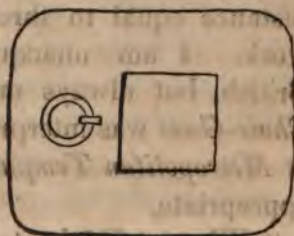
“ Amidst these researches I did not forget the naturalist ; I attentively examined all the parts so lately become accessible to the unprovided traveller, without finding any *lichens*, that could be called peculiar or uncommon. I obtained and brought away fragments of the newly fallen trilithon, and of the reputed altar-stone ; which, with a specimen also from the Grey Wethers, near Abury, will accompany this letter, and afford

you the desired information of their nature. The altar-stone seems not to correspond with the character of a basalt, as it contains much calcareous matter, fermenting with aqua-fortis; it is of a dark gray colour, interspersed with glittering particles, probably micaceous; after burning, it becomes brownish. I am not able to ascertain its native place, being at present unacquainted with any stone exactly and sufficiently similar to it in Wiltshire. I think you will admit the agreement between the other fragments, though taken from subjects more than twenty miles asunder. The granules of these appear, in general, pure, colourless and regular, under the microscope, which discovers little or no intervening cement; and after having undergone a red heat for a short time, the mass becomes more friable, and oftentimes, but not always, faintly mottled with red.

“ And here I must not forget to acknowledge an error in my former description of the sarsen-stones, which your well grounded suspicion first suggested; I was, indeed, under a deception concerning their seeming absorbent property, which, when submitted to your test, proved ideal and illusive. A fragment of about three ounces, after being immersed in water for many days, was not sensibly increased in weight; nor was the water, which at first but barely covered it, in the least diminished in quantity. The deception arose from forming a conclusion too hastily, on the trial of a few drops of water only, let fall upon the stone, which are almost as quickly dis-

persed, as if dropped on a lump of sugar, or blotting paper; but your experiment shows this to be merely superficial, and only tending to mislead.

" I never heard of any remarkable stone being in the river at Fighelden, about four miles north of Stonehenge; but one such, certainly, now lies in the same river at Bulford, about two miles north-east of the work, which probably may be the same you have inquired after. This stone, which our legendary hero, the devil, is said to have let slip from his ponderous bundle, I had never before seen, until my late visit. Lying near the bank I was able to approach it within four or five yards; and not being deeply, though entirely immersed beneath the water, I gained a very good view of it. In colour, it resembles the blocks of Stonehenge; its only visible surface nearly square, apparently about four feet wide. Near the middle of the area is a mortise-like cavity, in figure *square*; about one foot and a half in breath, and almost filled with rubbish. But what seems most singular and worthy of notice is, a metal ring fixed by a staple on one side of the stone, between the cavity and the edge; which the annexed rough outline will better express than words. This I distinctly saw, though beyond my reach; and was assured that many persons had handled it, and that it was iron.



“ If the work of this piece be coeval with Stonehenge, is it certain that iron could so long resist the effects of water, without being destroyed by corrosion? But perhaps it may not have lain thus immersed, so great a length of time; or the ring and staple may not be truly of iron, but copper, or some metal less affected by the watery element. The form and dimensions of this visible surface of the stone, which is probably only one of its ends,—the square figure of the cavity,—and the appertaining ring,—all seem to concur in declaring it not destined for a transom, nor a supporting pillar, which bears the tenon, not the mortise. It rather appears better adapted to the service of an altar; the ring to bind the victim, and, as we see in many Roman altars, the cavity to contain the fire. There are two other stones lying in the fields near Bulford, but quite rude and unwrought; though, perhaps, intended to be employed in the grand fabric, to which they are, in nature, similar.

“ I think it is not clear, that the metal tablet, as mentioned by Dr. Holland in Camden, was at all connected with Stonehenge, or had any reference to it; being only recorded as found in the vicinity of Ambresbury, which will admit of a distance equal to three or four miles from the work. I am unacquainted with the ancient British, but always understood, that the name *Choir-Gaur* was interpreted, the *Great Sanctuary*, or *Metropolitan Temple*, which seems sufficiently appropriate.

“ When at Edgbaston, I remember your speak-

ing of a Mr. Warltire, who had formed an ingenious illustration of Stonehenge, on an astronomical principle; perhaps it may partly agree with that of Dr. Smith, whose sentiments are reviewed in the Gentleman's Magazine for January, 1771, p. 30; a book entitled, 'Choir-Gaur, the Grand Orrery of the Ancient Druids.'

"If we compare together the remains of Stonehenge and of Abury, we must yield the boast of art and mechanism to the former; of superior antiquity, and extent of dimensions, to the latter. It is most probable, the authors of these works would begin at Abury, in the neighbourhood of the materials, before that remote spot on Salisbury plain. At Stonehenge, the more regular form of the masses, and the stupendous weight and height of the transoms, seem to indicate a more improved state of the arts than the blocks of Abury, which, though oftentimes more ponderous, are quite unwrought and rude; and always destitute of any incumbent transoms, which the too great interval of twenty-five feet between the stones, would not admit. The only instance of an incumbent piece, is, in a detached and single cromlech, in Clatford Vale, about four miles east from Abury; and popularly called the *Devil's Den*. This is a large convex stone, of an irregular quoit-like form; elevated about eight or nine feet from the ground, and resting upon two rude supporters, without any artificial tenon, or mortise.

"But the work of Abury, founds its claim to

admiration, upon the extraordinary and unparalleled extent of its once perfect state; an exterior circle of one hundred stones, in diameter one thousand three hundred feet: with two serpentine avenues issuing from it in different directions, each exceeding a mile in length, and each composed of two hundred stones, with a small double circle at the end of one of them; a plan which, when complete, must have produced an effect unspeakably grand.

“ When on horseback, I have been able to survey the upper surface of the cromlech; but never could observe upon that, nor upon the numerous surrounding Grey Wethers, any excavations that might be deemed artificial, like the Rock-Basins of Cornwall, so frequently described by Mr. Borlase in similar situations; nor any examples of his perforated and logan-stones.

“ Your observations, at Edgbaston, upon the terrace-like lynchets of our chalk hills, were not, indeed forgotten by me; they were the promoters of that paper you noticed in the Gentleman's Magazine for October, 1796, which your favourable mention of, has encouraged me here to acknowledge. I wish I could penetrate into their true cause, to which end, I should willingly attend to any hints you may suggest on the subject.

“ I now find myself justly called upon to apologize for the uncommon length of this letter, which has approached the limits of a second sheet; the subjects of your last favour, have insensibly led me forwards: but if you should not

feel wearied in the perusal, it will afford ample satisfaction to your obliged friend,

“ JAMES NORRIS.”

Dr. WITHERING to JAMES NORRIS, Esq.

“ Edgbaston, 30th July, 1797.

“ DEAR SIR,

“ Your long and valuable letter of the 6th of May, has frequently occupied my attention, and gratified my inquiries, respecting the important and curious subjects it embraces; and you would have received my thanks for it at an earlier date, had not a severe and continued indisposition rendered me averse to thinking, and incapable of writing many lines at any one time.

“ I am now nearly restored to my usual state, and shall without further preface set down such ideas as your letter, and the accompanying specimens, have excited.

“ Your account of the tenons and mortises in the overthrown trilithon at Stonehenge, is perfectly satisfactory, and I think with you that the rabbits must have had some share in effecting its downfall. The stone in the river at Bulford was probably, as you say, a Roman altar, and, if the ring be really of iron, I should on that account conclude that it is not of *very* ancient date, being able to prove that our predecessors were unacquainted

with iron at the time the Phœnicians traded with them for tin; though iron seems to have been plentiful at the time of the first Roman invasion.

"In Gough's "Camden's Britannia," (vol. i. p. 108,) in a note taken from Aubrey, it is asserted that the stones were brought from Marlborough Downs, that some were left by the way, that one lies in the water at Fighelden, and another between Rockley and Marlborough, resting on three low stones, in order to be carried away.

"A passage in the same page made me conclude that the tin plate had actually been found at Stonehenge; it begins thus:—'In the reign of Henry VIII. was found here a plate of tin,' &c.* I wish you could examine further into the *origin* of this tin plate, the *reality* of the ring being iron, and the *existence* of the stone at Fighelden. Had iron been known, or even any hard metallic substitute for it when Stonehenge was erected, I think the tenons would not have been left campanulated at the base. Of Choir-Gaur and Menam-

* In a letter of the preceding April to another correspondent the Doctor writes:—

"The late downfall of Stonehenge has again drawn my attention to that wonder of the world, but scarcely a dawn of light yet leads to the knowledge of those who built it. The *tin plate* with the inscription upon it, which was found in the reign of Henry VIII. and whose "*strange*" characters were unintelligible to Lilly the grammarian, and other learned men of those days, would, perhaps, if it had not been lost, throw some light upon the subject now the Oriental languages are so much cultivated."

bres I will speak at a future time. The season has suspended my attention from such subjects, and I cannot now readily refer to my notes and authorities.

“There cannot be a doubt that the great masses at Stonehenge are the same as the Sarsens or Grey Wethers, viz. a granulated quartz. The chrystals which compose this stone are closely compacted, without any intervening cement, possibly under great pressure and a degree of heat sufficient to agglutinate, though not to melt them. Some of the smaller and inner set of uprights are of a different nature, and the altar-stone is a micaceous sand-stone cemented by calcareous matter. The blackish particles in the calcareous stratum at Bromham are shirl.

“I apprehend that Mr. Warltire’s illustration of Stonehenge will be very different from that of Smith, but have not yet seen the book of the latter, though I believe it to be the best extant upon the subject. You will be pleased to learn that Mr. Warltire has a most accurate model made of cork, to a pretty large scale, of Stonehenge in its late state, and to the exactness of which I can bear testimony. He has also made another model of what he thinks was its perfect state. Of this every man must form his own opinion; after an attentive examination of it, I had only two amendments to suggest, and those not very important. From his declining health I fear he may not live to publish his theory, and that it will be lost to the world. Had Robes-

pierre's murderous axe spared the life of Baillie, I believe I should have been authorized to have purchased the models for his use, and he would have illustrated them, though Warltire had failed to do so.

"On conversing with my friend Mr. Watt respecting the late downfall at Stonehenge, he thinks that the three stones might be replaced at an expense not exceeding one hundred pounds. His extensive practical knowledge as an engineer, and his great abilities, are probably not unknown to you. He proposes to employ workmen from Portland island, who are much in the practice of moving large masses of stone, and have the requisite implements. He supposes that the large stones were originally raised up an inclined plane, made of a bank of earth, and should it be necessary he would again raise them in the same way. If I lived in your part of the country I would endeavour to obtain a subscription for the purpose. Surely fifty or a hundred persons might be found to subscribe such a sum. You may rely on my mite towards its accomplishment. Should you ultimately not find an engineer to your mind, I would try to engage Mr. Warltire to undertake the execution of the work, with more particular directions from Mr. Watt.

"I remain, dear sir,

"With great esteem,

"Your obliged and faithful servant,

"W. WITHERING."

JAMES NORRIS, *Esq. to Dr. WITHERING.*

" Nonsuch-House, Feb. 9, 1798.

" DEAR SIR,

" From your last letter of July 30th, I was much concerned to learn that illness had, for a time, deprived me of the pleasure and instruction of your correspondence. Every lover of science must feel interested in the restoration of your health, and hope that a long and uninterrupted course of it may enable you to pursue those paths wherein you have afforded the world so much information and delight.

" I have been this last year three times at Stonehenge, and in many other parts of the plain; near the end of April, the middle of June, and the beginning of August.

" The re-erection of the late fallen trilithon has not remained entirely unthought-of in Wiltshire, and I heard mentioned a mechanical person, near Ambresbury, who would undertake the work for a sum within £50. Surely the Duke of Q——y, who is, I believe, the fortunate possessor, would not shrink from patronizing alone that undertaking which must immortalize his own name, as well as that of the modern Archimedes who shall succeed in the execution of it. But, when done, care should be taken to guard against every possible cause that might

produce a repetition of the accident in that or any other part of the structure. At all events, I feel consolation in the existence of Mr. Warltire's model.

“ I fear the *tin plate* will baffle the inquiries of the antiquary; if it ever were found, it may still exist, possibly, in the obscure possession of some, ignorant of its history and its value. I have sometimes thought a public advertisement, with a proper reward, might be the means of its recovery, but that it opened an avenue to imposition and fraud, ever on the watch to draw down ridicule upon such pursuits. At my first visit to Stonehenge, last year, I omitted to obtain specimens of the third kind of stone, of which the smaller series are formed; and, afterwards, being unprovided with a proper instrument, I could only avail myself of some very small fragments, which the late exertions of some naturalist, perhaps, had loosened from the blocks: such as they are, I have sent them for your examination, and to complete the natural history of the work. They are different from the altar-stone, and from the large masses composing the transoms and their supports, and are much harder than either. The fresh broken fragments are of a deep bluish slate colour, darker and finer in texture than the altar-stone; without those numerous glittering particles; not fermenting with aqua-fortis; and containing sometimes a speck of seemingly metallic matter. I cannot guess whence they came:—but the contemplation

of the beholder dwells with astonishment only on the carriage and erection of the gigantic sarsen masses.

“ The stone in the river at Bulford, though probably an altar, seems too plain and unwrought for Roman workmanship; it is destitute of mouldings or other ornaments, and the cavity in Roman altars, if I mistake not, is always circular. I was at Bulford again in August last, and conversed with the farmer who occupies the estate on which it lies; he assured me he had been upon it, when a long drought had laid dry its surface, and that the ring is certainly of *iron*. But I found him inclined to invalidate the opinion of its antiquity, by relating a tradition, which I will here repeat: ‘ it is said, that, formerly, a railing extended across the river at this place, to detain the fish: that the square cavity in the stone received one of the supporting posts: that another similar stone was once placed in the river also, near the opposite bank, for the same use; and that the ring is of later date, and fixed only to attempt the removal of the block.’ Be this relation true or false, I cannot but think it improbable, at least, that so much needless trouble and expense should be incurred, when a post firmly fixed in the earth of each bank only, would have been fully adequate to the purpose. He says the nature of the stone is different from any of the three kinds at Stonehenge: that it is softer, and agrees with the productions of the Chilmark quarries, situated about fifteen miles

south-west of Stonehenge and about twelve miles west of Sarum.

“ From Bulford I went to Fighelden, and made many particular inquiries of aged and intelligent natives of the place concerning the stone said by Aubrey to lie in the river there. Their invariable reply was, ‘ that *none* such was ever known to exist at Fighelden, or nearer than Bulford; where (added they) is to be seen one corresponding with the description.’ It is almost certain, then, I think, that the Bulford stone is the real object of that writer, who has fallen into a local error in the name, and in about three miles in the situation of the place.

“ I have, with as little success, sought also after the *prepared stone*, mentioned by Aubrey, as lying between Rockley and Marlborough. The intervening tract of downs, which does not exceed about two miles, I have attentively surveyed; but nothing of the kind, nor even a single *sarsen* in its natural bed, is to be seen in that course, on the the right hand or on the left. And though the etymology of the name Rockley seems to imply an abundance of stony masses, the complete reverse is *now* the fact, however it might have been in past ages, before so many of them had been broken for the construction of houses in Marlborough and the neighbourhood; — a practice that still continues, and annually lessens their number in every assemblage. In the opposite direction, about a mile and a half north-

west from Rockley is a district called *Temple-farm*, overspread with numerous and vast masses of stone: but this is foreign to our purpose. Persons who have been long well acquainted with the country around Rockley and Marlborough concur also in having no knowledge or recollection of this remarkable object of Aubrey's notice. Whether he had ever seen it himself, or only related the accounts of others, I know not:—but, from the result of my search at Fighelden, I am induced to suspect the latter. I am, however, inclined to believe here also, the existence of some foundation for the error, and that he meant what I have described in my last letter, the *cromlech* in Clatford Vale, called the *Devil's Den*. Although the incumbent stone of this actually rests on only *two* supporters, about five or six feet high, there is besides a third intermediate stone, which has, probably by sinking, ceased to perform the office of a support. The situation of this *cromlech* is certainly not in the line between Rockley and Marlborough, but more than a mile distant south-west from the middle of that line; yet as nothing in any degree corresponds with Aubrey's description but this, it seems probable that he may have, by some means or other, again fallen into a local error. But the positions of the supporters are as *artificial* as the situation of the incumbent stone; they are set up edgeways in the ground; a needless labour only for the temporary resting-place of a block in its way to Stonehenge, and sufficient to

refute that idea of its destination: I believe it to have been intended ever to remain where it now stands.

“The trilithons of Stonehenge are, perhaps, improved copies of the more ancient cromlech;—the polished offspring of a ruder parent. Perhaps the mode of connecting the stones by spherical segments may have been first suggested to the constructors of the trilithon, by observing the similar articulation between the thigh-bone and the hip. The rectangular mortise and tenon now in use were probably a later invention; as none would relinquish the aid of its superior firmness, when once known, for the comparative instability of the other. Stonehenge is, I believe, the only known work of the kind extant called *Celtic* or *Druidical*, wherein any sort of mortise and tenon has been made use of; and this circumstance, together with the more regular form of the masses, appear to be marks of its being also the least ancient of its tribe, because most improved; unless we attribute to the arts a retrograde course.

“The large topographical map of Wiltshire, in eighteen sheets, on a scale of two inches to a mile, by Andrews and Dury, traces out a valley proceeding southerly from the village of Clatford, and therein called *Clatford-bottom*; but the vale in which the cromlech stands runs northerly from the village, and is not properly expressed in that map, which I have otherwise generally found very correct and useful.

“ But although the opinion that the great masses of Stonehenge were brought from the downs about Marlborough, be deprived of the support it would have received, had the relations of Aubrey, concerning the stone at Fighelden and that near Rockley proved accurate, yet it still remains the only probable conjecture.

“ A large portion of Wiltshire consists of extensive, elevated, and open downs, mostly calcareous, and naturally divided into two tracts, never uniting, northern and southern, by an inclosed and lowland vale, which at a mean may be between four and five miles broad. The upper stratum of this vale is not calcareous, like the downs that bound it on either side, but principally consists of a loose powdery soil, proceeding from a decomposed pulverized tripoly, which, in the banks of deep hollow ways, &c. frequently appears in its indurated state. This tripoly is very common about Devizes, for many miles round, and seems to be the basis whereon the calcareous matter generally rests; and, even in the vale, some eminences appear slightly over-spread with chalk.

“ The ponderous blocks must cross this valley in their passage to the southern tract, from off the northern, the descents from which are steep and difficult. Upon a contemplation of the face of the country, it seems probable they were conducted down a pass between *Milk-hill* and *Work-way*, the most practicable and easy of any; that they afterwards proceeded by Alton-Barns,

Honey-Street, Woodborough, Hilcot, Rushall, and Upavon, and here, arriving at the southern tract of downs, and the river Avon, they easily, and as it were on a level, entered its vale along the western bank, without ascending the hills on either side; and that the conductors of the business, being doubtless not unmindful of the advantage of continuing in the vale, near the river, thus proceeded beside the western bank, by Compton, Enford, Netheravon, Fighelden, Durrington, and Bulford, without encountering the difficulties of ascent and descent, which would have occurred so very frequently, had they departed from the vicinity of the Avon. At Bulford they were obliged to quit the vale to attain the chosen site of the work, about two or three miles further towards the south-west, and to pass over an intervening hill, on which a very large and unwrought *sarsen stone* now lies conspicuous, about midway between Bulford and Stonehenge. The whole course of these gigantic materials cannot be less than twenty miles.

“ In the lowland vale separating the northern and southern tracts of downs, there was entire, in 1773, near Woodborough, an immense block, popularly called *the kissing-stone*. This, I learned with regret, has been broken and dispersed for various purposes, more than twenty years past; and now not a fragment remains upon the spot. It was probably of the *sarsen* kind, so commonly broken on the Marlborough downs for building, &c. in default of other stone, which is very

scarce also about Woodborough. It has, perhaps, been thus made use of; and in truth, I observed some neighbouring cottages partly constructed with sarsen fragments. To deem it a mass destined for Stonehenge, does not, I think, appear extravagant; it seems, certainly, to have been brought thus far into the vale, from off the northern tract of downs. Although the mysterious ceremonies of ancient times had long ceased around this stone, yet its modern name implies the celebration of *other rites* that succeeded them, and that should have preserved it from destruction; and this it would have done, it is said, had not the unrelenting possessor remained deaf to the entreaties of the villagers.

“About a mile and a half, south-west from the site where this stone lay, at a small arched foot-bridge over a rivulet, is a spot called *Limber-stone*; where I noticed some large pieces of sarsen-stone, lying beside the stream. To found a conjecture on this, and the name only, may be thought unwarrantable; therefore, I will only observe, without laying any stress on it, that by allowing a small latitude of signification to the word *limber*, the present local name might possibly proceed from the ancient existence here, of what is called a *Rocking-stone*; but, to this idea, I have not learnt any tradition that can give support.

“About a mile and a half also, from the site of the before-mentioned kissing-stone, but more southerly, near the village of Marden, is a re-

markable tumulus called *Hatfield-barrow*; the only work of the kind, I believe, to be found in this lowland vale, although so very frequent on the elevated downs on both sides. It stands in an enclosure, and is above the usual size, and nearly hemispherical; it is surrounded by a broad circular intrenchment, which, from being constantly supplied with water by innate springs, forms a sort of moat, which does not become dry even in the midst of summer; a circumstance I have never found attending any other barrow. In this watery ditch, the *Menyanthes trifoliata*, or *bogbean*, plentifully grows; a plant which I have not seen elsewhere in that neighbourhood. The whole of the barrow is at present ploughed over, and is said to be more fertile than the surrounding field. I have seen it clothed with wheat ready for the sickle; when the richness of colour, and the beautiful undulations of the corn, formed an object as pleasing as it was uncommon.

“ The ancient people, who raised so many similar sepulchral monuments on the northern and southern tracts of downs, are proved, then, by the testimony of *Hatfield-barrow*, to have been present, at least for a short time, in the intermediate vale; and from its being the only barrow hereabouts, it is probable their continuance here was but temporary. This consideration, strengthened by the concurrent though indirect support of the kissing-stone, seems to point out the path of those who slowly and patiently conducted across the vale, such ponderous

masses from one tract of downs to rear them on another.

“ Dr. Stukeley has hazarded a conjecture, that the Driuds, whom he regards as the certain constructors of Stonehenge, were a branch of the Egyptian priesthood, that sought an asylum in Britain, from the fury of the Persians, under their cruel and relentless leader Cambyzes ;—but with respect to this idea, the veil of uncertainty will probably never be drawn aside. In turning over lately the authentic and much esteemed designs of ‘ Norden’s Travels in Egypt,’ I made some observations, which I shall here take the liberty to introduce. In plate 112 are represented the ruins of what is called the ‘ Temple or Palace of Memnon, at Thebes.’ Some parts of these remains marked D. and E. correspond in some degree with the structure and arrangement of the stones, composing the outmost series at Stonehenge ; two ranges of square massive pillars supporting a continued plain architrave ; but the square pillars are not simple blocks of stone, but compound ; they are also ornamented with statues at their bases, and are overspread, besides, with hieroglyphics, wherein the resemblance fails.

“ In the outmost series at Stonehenge are still standing, towards Ambresbury and the north-east, four contiguous uprights with their three connecting transoms ; these in some degree imitate, though rudely, that part of the Theban remains marked D. In plate 132, the building

called 'the Temple of the Serpent Knapthia,' exhibits something of a similar structure; but the architrave over the row of square pillars, is further ornamented with a kind of cornice. If we were disposed to favour the opinion of Stukeley, by collecting more analogies between the most ancient structures of Britain and of Egypt, we need not stop here. The six small stones of the inmost series, still standing round the altar at Stonehenge, have a peculiar and remarkable form; they are more wrought than any of the others, they are angular and lessen upwards gradually, very like the true Egyptian obelisk, as seen at Thebes and other places. Silbury-hill, and the numerous barrows, particularly the pyramidal tumulus you noticed between Ambresbury and Everly, bear no very distant resemblance, in form, to those gigantic and strong-built sepulchres, the Egyptian pyramids. But I will here cease to trouble you any further with such conjectural comparisons.

" I fear my letter has extended to a length so immoderate, that, in the perusal, you will feel less patience, than, you may think, I had in writing of it. If it contain any matter deserving your attention, it will afford every recompense to

" your obliged

" and humble servant,

" JAMES NORRIS."

Dr. WITHERING to JAMES NORRIS, Esq.

“ Edgbaston, December 3, 1796.

“ DEAR SIR,

“ I have long been apprehensive that you might think me ungrateful for your last favour, and insensible to its claims, but I can most truly aver that I never received a letter that gave me more pleasure, or more instruction. Fourteen folio pages, as full of merit as of matter, required something more than an immediate answer; but before I was qualified to judge and to form my opinion concerning some of its contents, a state of constant hectic fever kept me indisposed to every exertion until August, when the most severe peripneumony I ever experienced nearly robbed me of existence. My recovery has been slow, so that it is only within a short time past that I have been able to discharge an accumulation of debts to my correspondents, or to think with any degree of energy. I thank God for the restoration,  I dedicate some of the first fruits of it to you.

“ This letter shall treat chiefly of Botany, another on antiquities may be expected to follow in a short time.

“ The altar-stone I did mention as a micaceous grit with calcareous earth ; the great stones are granulated quartz, and of this kind of stone Windsor castle is built, but I do not know enough of the country to say from whence it was obtained.

“ You are perfectly right in describing the smaller series of stones as different from the others ; that which you now send is a basalt, and they may all be so ; but still I have some faint recollection that the smaller uprights are not all of the same kind. The shining specks are not metallic, but either minute particles of mica, or pyrites.

“ You say the tripoly in its indurated state appears in the banks of deep hollow-ways, and that, when decomposed, it forms the soil of the vale between the calcareous hills. I have some doubt, founded merely on situation, whether this supposed tripoly be really so, or whether it will not prove to be some kind of pyrites.

“ My next letter shall be filled with ideas and conjectures on the origin of your great monument ; and I shall be well repaid the trouble of writing it, if it should inspire you with the ambition of becoming the *Historian of Stonehenge*, an office for which your industry, zeal, and knowledge, eminently qualify you.

“ I remain, dear sir,

“ Very truly your's,

“ W. WITHERING.”

Dr. WITHERING to JAMES NORRIS, Esq.

“ Edgbaston, Jan. 1799.

“ DEAR SIR,

“ I shall first speak to the points mentioned in your letter concerning Stonehenge, and then set down promiscuously such ideas as have occurred to myself relative thereto, and, in consulting brevity, may often seem to express myself peremptorily, though I mean the whole to be considered only as conjectural.

“ The chips you sent me of the smaller series of stones are basalt. I doubt whether these stones are all of the same material. If I recollect rightly some of them are many-sided prisms. Such are the basaltic columns on the coast of Antrim; and such are not to be met with nearer than that coast. May not this fact have given rise to the legendary tale of the Devil, or Merlin, bringing Stonehenge from Ireland?

“ I take it for granted, that Stonehenge is neither of Celtic or Druidic origin. It is a structure by far too artificial for such barbarous people, and is the work of a much more enlightened nation, who were afterwards expelled, or destroyed, by those rude invaders from the north of Europe.

“ The spherical mortise and tenon cannot be said to want firmness or stability in masses of so

much weight, and are certainly stronger than the rectangular ones. But if iron was then unknown, materials so hard could not be worked and joined by any other mortise and tenon than by such as now exist in the monument in question.

“ I agree with you, that the stone in the river at Bulford has nothing to do with Stonehenge; it is a different kind of stone, and the iron ring bespeaks a much later date.

“ The course you have traced out for the carriage of these blocks seems very satisfactory; and none of them are too large to have been conveyed by human strength, with no other machinery than bars, ropes, and levers.

“ Ignorant of the Welsh language, but sometimes forcibly struck with the similarity of some words, both in sense and sound, to the Greek; I thought the former might, as well as the people, have had one common origin with the latter. This idea was not a little strengthened by Cæsar having said that the Druids “ *Græcis litteris utuntur* ;” and I set to work in full expectation of verifying this conjecture. The result, however, has been exactly the reverse; and I am satisfied that neither the ancient Britons, nor their language, have had any connexion with the Greeks. I now suppose that this island was once more or less peopled by a race of men who had many things in common with the Greeks, and which was possibly part of that stock from which the Grecians derived both

their letters and their knowledge, for I think the arts were existing here at an earlier date than in Greece.

“ The northern tribes, who first subdued the more civilized inhabitants of our island, and from whom the Welsh, the Cornish, and the Highlanders are descended, must have done this long before the first Roman invasion, because we may collect from Cæsar that the eastern parts of the island were in his time inhabited by other tribes from the continent, who seem to have driven the first invaders, the Welsh, &c. more to the west and to the north.

“ But these first invaders continued to call many of the more prominent and more permanent features of the country, by the names which their predecessors had given them; and here it is, and here alone, that the Welsh language bears a resemblance to the Greek. Take the following examples, observing that the long *o* in Welsh is expressed in writing by a *w*, thus (*w*.)

Welsh.	Greek.	
<i>Bala</i> , ...	Βαλω,	emitto, profundo; the name of a lake.
<i>Elwy</i> , ...	Ελωε,	from λωεω, lavo.
<i>Rhee</i> , ...	Ρεω,	fluo.
<i>Llyn Teggy</i> , Τεγγω,		rigo, irriigo. A lake near Bala, the source of the river Dee.
<i>Roden</i> , ...	Ροδανος,	valde rapidus.
<i>Conwy</i> , ...	Κονεω,	curro.

Welsh.

Greek.

Cader Idris, Καθεδρα, (or) εδρα.

but enough of this.

“ The most ancient name of Stonehenge is Menambres, and hence the town called Ambres, with the addition of the Saxon termination ‘bury.’ But what is Ambres? Is it not from Αμβροσια (or) Αμβροσιος, immortal, sacred, or divine? But what is Men, or Mene? Is that also of Grecian parentage, μην, and was it a temple dedicated to the Moon? or is it from the Armoric ‘*Maen*,’ (Stone)? but *Maen*, I am told is also ‘Stone,’ in the Hebrew, and it is allowed that the Phœnician was a dialect of the Hebrew, but little different therefrom. I am inclined to favour the latter interpretation.

“ A line drawn from the great trilithon, through the principal entrance, directs to a large stone standing at some distance on the avenue to Stonehenge. This stone is not exactly upright, but inclines towards the building, and seems as though the inclination was occasioned by its foundation giving way; but Warltire expects that it was originally placed in this inclined position, and that the pillar above ground forms an angle with its base below. Much depends upon this point, and it may readily be ascertained. I was there in the midst of the hay harvest, and could not procure workmen, or I should have prevented you the trouble of these inquiries.

“ This inclining stone may be considered as

the key of the whole structure. Warltire says its inclination is such that the meridian moon, when in its greatest southern latitude, casts no shadow. That the top of the great trilithon, on the longest day, throws its noontide shadow along the edge of the altar-stone; and on the shortest, that its shadow cuts the impost over the principal entrance, and catches the apex of this inclining stone.

“ There is no mention of iron being found in any of the barrows, but iron was used at the time of the Roman invasion. Iron was unknown in this island when the Phœnicians traded here for tin, and even after the digging for tin ore had been practised to a great extent, and with no small degree of skill. These Phœnicians are supposed to have been amongst the first manufacturers of glass, and that it was an article of trade with the barbarous nations, is evident from the quantities of beads found in Ireland, in England, and in some of the barrows in question. So we still purchase with beads of glass the commodities of uncivilized people.

“ The extent of navigation practised by the Phœnicians proves a considerable degree of astronomic knowledge, though it may not be possible to say whether this knowledge originated with themselves, or was derived from the Egyptians, the Bramins, or elsewhere. It is allowed that the Grecians derived their knowledge from one or other of these sources; and it is now

generally believed that the Egyptians were preceded in science by the Orientalists, and the signs of the Zodiac existing in the pagodas of India, clearly proclaim the source of astronomic knowledge.*

“ Should we meet with a great astronomical instrument in India of a circular form, built of stone, and within that, but not so lofty, another circle of stone, we should be reminded of Stonehenge, though the latter has no central pillar, nor its walls one continued mass of masonry; and though the great trilithons, and the elliptic range of uprights, do not appear in the former. The division of the circle into 360° , coincides with the thirty imposts which connected the outer circle at Stonehenge.†

“ But these instruments at Benares are confessedly of modern construction, and cannot, therefore, be supposed to exhibit exact types of very ancient ones, erected, perhaps, in the less polished ages of the Bramins; but it is something to show that the leading principle in structure and materials is the same.

“ There now arises a question whether our astronomical instrument was erected by the Phœnicians, or by the still more ancient Bramins? This question must remain for ever unanswered, if the present researches into Oriental antiquities

* Vide Phil. Trans. v. 62, p. 353.

† Ibid. v. 67, p. 598.

do not afford a solution of it. I am not without hope that this may be done, and in the supplement to 'Indian Antiquities,' a passage is quoted from one of their sacred books which establishes the existence of an Indian colony in the British Islands.

" But granting this origin, and admitting all the varied astronomical uses of Stonehenge, so ingeniously demonstrated by Mr. Warltire; what shall we say to its being applicable to any such purposes, because 47° to the west of the meridian? I cannot concede to Mr. Warltire, the gradual change of the meridian-line, nor allow his calculation that Stonehenge was in the meridian-line many thousand years ago. His reasonings do not convince me, nor do I believe, from his reserved manner on this point, that he himself is fully satisfied about it.

" But it is certainly probable, I may say almost demonstrable, that Great Britain was once connected with the continent. Let any one look at a map and compare the two opposite coasts, he will be struck with the correspondence of the head-lands and the indentations; and from personal examination I know something of the identity of the strata on the two opposite coasts.

" Now I do not assert that Stonehenge was erected prior to the separation of England from the continent; but I do say that if you consider the Straits of Dover as the centre of motion, and bring the southern counties eastward until they

again join the continent, that you will find *Stonehenge restored to the meridian line.*

“ You may well suppose that I am now arrived at the very summit of the climax of conjecture, and that I have nothing more extravagant to add. I confess this to be the case, and shall, therefore, conclude; remaining, dear Sir,

“ Very truly your’s,

“ W. WITHERING.”

FLORÆ
ULYSSIPPONENSIS SPECIMEN:

WITH SOME

CHARACTERISTIC REMARKS,

AND

A N I N D E X.

Nov. 1792.

1. *ARUM arisarum*.

Alcantara. Braço de Prata, &c.

2. *RANUNCULUS bullatus*.

Alcantara.

3. *CLYPEOLA maritima*.

St. Jozè de Riba Mer. Vide No. 36.

Jan. 1793.

4. *CALENDULA officinalis*.

In ploughed fields and gardens, plentiful.

It is used as food for milking cows, and yields very good milk.

All the *leaves* strap-shaped, or strap-egg-shaped; but the upper ones in *CALENDULA arvensis* are heart-shaped.

5. *EUPHORBIA peplus.*

Common in gardens, and elsewhere.

6. *URTICA urens.*

Bunches, or rather sheaths, of barren flowers uppermost, four in a whorl, each sheath ending in a spit-point. *Calyx* coloured. *Rundles* of fertile flowers underneath, in whorls.

7. *GERANIUM Malacoides.*

Linnæus states this species to be a native of England. Vide *Reichard, Syst. Plant.* vol. iii. p. 319.

Fruit-stalks from the crown of the root, trailing, cylindrical, hairy, furnished with two, coloured, skinny *floral leaves* at the top, from whence proceed from two to six *flowers*, each supported on its proper *fruit-stalk*.

St. Jozè de Riba Mer.

8. *THLASPI Bursa-Pastoris.*

With the *root-leaves* entire. Garden at St. Jozè.

9. *ERIGERON bonariense.*

Gardens and road-sides.

10.

11. *SOLANUM nigrum.* β .

Garden at St. Jozè.

12. *SOLANUM nigrum.*

St. Jozè.

13. *FUMARIA spicata.*

Leaves glaucous. *Floral-leaves* semicircular, toothed. St. Jozè.

14. *FUMARIA officinalis.*

Floral-leaves spear-shaped. St. Jozè.

15. *MERCURIALIS annua.*

Some plants have a few fertile *flowers*. *Calyx*

smooth in the barren,—hairy in the fertile flowers.
Garden at St. Jozè.

16.

17. *SINAPIS alba*.

Garden, St. Jozè.

18. *SALVIA pratensis*.

The gummy state of the upper lip of the blossoms
not constant. St. Jozè.

19. *PAPAVER dubium*.

Rays from four to eight, but mostly seven. *Flowers*
rarely more than one on a stem. *Ribs and edges of the*
leaves set with bristles, as also the *calyx-leaves*. Gar-
den, St. Jozè.

20. *SONCHUS arvensis*.

St. Jozè, Garden.

21. *BORAGO officinalis*.

Common.

22. *VERONICA ægrestis*.

Garden walks, St. Jozè.

23. *SILENE portensis*.

Only a variety of *SILENE insperata*. A variety, *fo-
lits crispis*, grows also with the other.

Fields and gardens, St. Jozè.

24. *NARCISSUS tazetta*.

In a wet kind of meadow, near Belem, very plentiful.

25. *CONVOLVULUS tricolor*.

Exactly the plant of the English gardens.

Fields, St. Jozè. March.

26. *RAPHANUS Raphanistrum*.

Petals cream-coloured, streaked with strong purple
lines which project on the under side.

Corn-fields.

27. *CALENDULA officinalis*. Var.

- Leaves* more fleshy than in the garden plants.
Fields, very common.
28. *CENTAUREA pullata*.
Fields, St. Jozè.
29. *ALSINE media*.
Roofs and gardens.
30. *MOMORDICA Elaterium*.
Rocks below St. Jozè, facing the Tagus. Caldas.
Flowers in April.
31. *IRIS pumila*.
Blossom large, of a beautiful rich purple. Sometimes four *summits*; four plain, and four bearded *petals*; also four *stamens*. The bearded petals reflected, the others rather bent inward. In a dry field, plentiful. January.
32. *VINCA major*.
Fields and hedges.
33. *CHENOPODIUM vulvaria*.
Fields and gardens about Buenos Ayres.
34. *GERANIUM Romanum*.
Fields.
35. *OXALIS corniculata*.
Little leaves heart shaped. *Stamens* alternately shorter. *Filaments* connected at the base. *Stem* trailing, striking root at the joints. Rocks facing the Tagus. St. Jozè.
36. *CLYPEOLA maritima*. Vid. No. 3.
Calyx leaves standing wide, but curved inwards, often coloured.
Petals, claws sometimes purple, half the length of the diameter of the *limb*, which is circular, entire, white, turned outwards, and backwards.
Stamens, purple, crooked, tapering upwards: anthers yellow.
Seed-bud, pear-shaped; *shaft* short; summit flat, yellow.

Seed-vessel, broad spear-shaped, nearly flat, not notched at the end, but pointed by the remains of the shaft, hairy, of two cells, the partition parallel with the valves.

Seeds, one in each cell, but one of the cells not unfrequently abortive.

Stem, simple or branched, in the other plants rather woody, trailing, more upright and herbaceous when young.

Leaves, very entire, spear-strap-shaped, feeling like cloth. Very common on rocks and hilly grounds both on the sea-shore, and elsewhere. Flowers all the year. Vid. No. 61.

37. *BUNIAS Cakile*.

It seems rather to be a *CHEIRANTHUS*; but the *pod* contains only a single seed, and when full grown has a remarkable tooth-like gland on each side its base. Sea shore, St. Jozè.*

38. *HEDERA Helix*.

Very luxuriant. On walls.

39. *PARIETARIA officinalis*.

Foliis ovato-lanceolatis. Rocks and walls. November, January.

40. *NEPETA Cataria*.

Calyx open. *Bloss.* Upper lip nearly upright, longer than the stamens. Lower lip, middle segment notched, lateral ones turned back. *Stem* trailing, woody. In fields.

41. *CONYZA saxatilis*.

Leaves toothed. Rocks below St. Jozè.

42. *FRAXINUS excelsior*.

In flower the first week in January. Seed-vessel grown large and green, and leaves expanding by the end of February.

* Also plentiful on the sands at Teignmouth.

43. SCABIOSA ———.

If so it does not agree with any of the Linnæan species; but may be thus characterized: *Corollulis quinquefidis, foliis radicalibus lanceolato-ovatis, apicibus serratis, bracteis linearibus integerrimis, caulenudo.*

Flowers pale purple, collected into an oblong, proliferous head.

Blossom sometimes with only four clefts, not quite regular. Fields about St. Jozè. January.

44. POLYGANUM ———.

Nearest resembles the POLYGANUM *persicaria*, or some of its varieties, but seems a distinct species; and may be thus characterized: POLYGANUM *floribus hexandris digynis, foliis lanceolato-ovatis, caule repente.*

Fulcra pointed. Flowers in flat heads, lateral, and terminating.

POLYG. *minus*. of Huds. and Bot. Arr.

Fields near St. Jozè.

45. CICHORIUM *intybus*.

Common.

46. CASSIA (*pubescens*).

The nearest allied to CASSIA *biflora*, but has not the *pedunculis bifloris*.

It was imported from the island of Madeira by Mr. Masson, and may be thus described: *C. foliis sejugis vel septemjugis, lineari-lanceolatis, floribus corymbosis, terminalibus.*

A small pointed dark coloured gland on the leaf-stalk between each pair of leaflets.

Leaves with a very fine wool underneath.

A beautiful tree in the garden of Mr. Brander, at St. Jozè.

47. VIBURNUM *Tinus*.

Forming hedges in the Quinta at St. Jozè.

48. *ROSMARINUS officinalis*. β .

Forming hedges at St. Jozè.

49. *JASMINUM grandiflorum*.

In the gardens only, and covering the houses with its fine flowers throughout November, December, and January.

50. *AGARICUS lachrymalis*.

On grass walks after rain, St. Jozè. January.

51. *LEONTODON tuberosum*.

Stalk supporting a single flower.

Leaves lying flat in a circle on the ground. Garden walks, St. Jozè.

52. *TREMELLA Nostoc*.

Plentiful after rain. Garden walks, St. Jozè.

53. *LYCOPSIS arvensis*.

Var. flore albo.

Stem simple or branched, the branches towards the top. *Tube* of the blossom but very little bent. Garden, St. Jozè.

54. *SILENE rubella*.

Limbs of the petals pinky.

Anthers purplish.

Leaves glaucous. Fields, St. Jozè.

55. *HYOSCIAMUS albus*.

St. Jozè.

55. *CHEIRANTHUS annuus*.

Rocks, sea coast, St. Jozè.

56. *CALENDULA pluvialis*.

In the Botanic garden of the Ajuda palace. Exotic.

FUCHSIA ———.

The plant commonly so called, is considered by Father Mariana Velloso as a *planta dubia*, bearing a *capsule*, rather than the proper *berry* of the real Fuchsia.

57. *LYGEUM Spartum.*

Much used for making ropes and mats. Usually imported from Spain, but grows wild in the Algarve. Botanic garden, Ajuda.

58. *PRUNUS spinosa.*

St. Jozè.

59. *RANUNCULUS ficaria.* Linn.

FICARIA verna. Bot. Arr.

Whole plant much larger than in England. *Leaves* two inches long, and one and a-half in breadth. *Petals* nine to fourteen. St. Jozè.

60. *LEPIDIUM nudicaule,* vel

COCHLEARIA officinalis.

Leaves heart-shaped, entire, on long leaf-stalks. *Peduncles* long, rising from the root. *Seed-vessel* of two cells, about four rough seeds in each, placed alternately on short *pedicles*. *Petals* purple, entire, turned back, streaked with deeper purple lines. *Stamens* six.

Possibly the exception noticed by Gouan in Reichard.

61. *CLYPEOLA maritima.* Vide 36.

The *pouch* being oval and entire it cannot properly be a *CLYPEOLA*: and the *shaft* is rather too long for a *DRABA*.

It is more probably the *ASYSSUM Halimifolium*, but destitute of the teeth on the filaments which characterize that genus. Vide *Hort. Kew.*

Very common on the limestone-rocks on the north side of the Tagus, six miles below Lisbon.

62. *ASPHODELUS ramosus.*

Petals certainly six. St. Jozè.

63. *ASPHODELUS fistulosus.*

Agrees with *ANTHERICUM* in the full expansion of the *petals*, and in their number, six; but the *stamens* are fixed to six glandular valves embracing the seed-bud,

the same as occur in *Asphodelus ramosus*. About St. Jozè.

64. *ACHILLEA ageratum*.

Young shoots issue from the old stems. Each *floret* furnished with an egg-oblong, chaffy scale. *Outer florets* sometimes with three clefts, and only pistils.

On the rocks about St. Jozè.

65. *RUTA graveolens*.

Colour much lighter and pleasanter than when cultivated. On the rocks near St. Jozè.

66. *CENTAUREA phrygia*.

St. Jozè.

67. *EUPHORBIA helioscopia*.

Fields about St. Jozè.

68. *CYNOGLOSSUM lusitanicum*.

Fields about St. Jozè.

69. *VIOLA odorata*.

Garden, St. Jozè.

70. *NARCISSUS bulbocodium*.

A most elegant *flower*, of a fine yellow, and tending to transparency. Fields near St. Jozè.

71. *CONVOLVULUS althæoides*.

Not uncommon near Belem. — Flowers chiefly in April.

72. *CALENDULA arvensis*.

——— *officinalis*?

Stem thick, strong, deeply fluted. *Leaves*, upper ones heart-shaped, lower ones strap-egg-shaped, all of them embracing the stem. Common in fields.

73. *ANAGALLIS moneli*.

Fields, St. Jozè.

74. *THLASPI perfoliatum*.

Stem simple or branched. *Foliis imis petiolatis, ova-*

ris; *aspericribus cordato-lanceolatis, serrato-dentatis, amplexicaulis.*

Petals twice as long as the calyx. *Stamens* the length of the calyx.

75. *SINAPIS alba.*

Fruits.

76. *CLYPEOLA tomentosa.*

Petals yellow, cloven, longer than the calyx. Two or three seeds in each cell of the pouch. Fields near St. Jozè.

77. *GERANIUM molle.*

Garden at St. Jozè.

78. *AMYGDALUS persica.*

In gardens.

79. *RESEDA luteola.*

Fields near St. Domingo.

80. *CAUCALIS Daucoides.*

Fruct-leaves four, three of them cloven, one trifid. About St. Domingo. January 31.

81. *SINAPIS nigra.*

Road-sides near St. Domingo.

February, 1793.

82. *CHEIRANTHUS incanus.*

Rocks by the Tagus.

83. *BROMUS asper.*

Only two *stamens* in each *floret*, and five *florets* in each calyx.

B. diandrus. Lin. r. Tv. 4.

B. madritensis. Bot. Arr.

St. Jozè, garden walks.

84. *EUPHORBIA exigua*.

Garden walks, St. Jozè.

85. *SHERARDIA arvensis*.

St. Jozè.

86. *ALYSSUM montanum*.

Two of the *filaments*, with strap-shaped teeth fixed to the inside. *Petals* notched at the end. The *fol. punctato echinatis* very beautiful and characteristic. Garden-walks, St. Jozè.

87. *RICCIA minima*.

——— *glauca*.

——— *chrysellina*.

Garden, St. Jozè.

88. *HYACINTHUS non-scriptus*.

No melliferous pores on the seed-bud. Segments of the *blossom* curled back. It differs in having the base of the tube of the blossom globular, the *bractea* fleshy, one to each flower, not longer than the fruit-stalk.

Leaves strap-spear-shaped, eight or nine inches long, nearly one inch broad. Smells like *H. orientalis*, which it possibly may be. Fields about St. Domingo.

89. *ANTIRRHINUM arvense*. Var. β .

Blossom bright yellow, with ten or more dark purple spots on the palate. *Spur* straight, sharply conical, dark purple. Fields about St. Jozè.

90. *AG. coronatus*. Var. 2.

Pileus pitted and porous, not cracking at the top. A pinky blush, mixed with the tints of stem and pileus. Corn-fields, St. Jozè.

91. *IRIS sisyrinchium*.

Fields a mile N. E. of St. Jozè.

92. *AMYGDALUS communis*.

In a garden at a village, a mile N. E. of St. Jozè.

93. **RAPHANUS sativus.**
 Petals streaked as in *R. raphanistrum*. In fields near St. Jozè.
94. **IXIA bulbocodium.**
 Ditto.
95. **ARISTOLOCHIA rotunda.**
 About St. Jozè.
96. **PAPAVER *Rhœas*. Var.**
Caule simplici, uniflora, petalis albis. Fields about St. Jozè.
97. **CNICUS acarna. β .**
 Fields around St. Jozè.
98. **CENTAUREA romana.**
 Near St. Domingo.
99. **SILENE inaperta.**
 This and *S. portens* seem to be one species. The latter has not *folia glabra*, according to Linn. but a little hairy.
100. **CYNOGLOSSUM *Lusitanicum*.**
Flowers in spikes, rolled spirally, like those of the *Myosotis scorpioides*. Fields about St. Jozè.
101. **GERANIUM *Romanum*.**
 Ditto.
102. **LUPINUS albus.**
Blossom sometimes pale blue. Cultivated in large fields; the seeds used in soups.
103. **NARCISSUS *pseudo-narcissus*.**
 Fields about St. Jozè.
104. **CERINTHE major.**
 By the side of a small drain, near a village two miles N.W. of St. Jozè. Vide 219.
105. **SINAPIS arvensis.**
 Fields about St. Jozè.

106. *ULEX Europæus*. β .
Legum. glabris.
107. *VICIA sativa*.
 Wild in fields about St. Jozè.
108. *ANTHEMIS nobilis*.
 No part of the plant hairy.
 Barren stony places about St. Jozè. Lanes about
 Braço de Prata.
109. *DIANTHUS arenarius*.
 Stony grounds two miles West of St. Jozè.
110. *BELLIS annua*.
 Fields on the right of the road leading to the Marquis
 de Pombal's, near a brook. Almada Hill.
111. *CUSCUTA Europæa*.
 In great quantity creeping amongst rocky ground,
 two miles N.W. of St. Jozè.
112. *ECHIU italicum*.
 Between Belem and St. Jozè.
113. *PAPAVER hybridum*.
 St. Jozè.
114. *THLASPI perfoliatum*.
 Garden at St. Jozè.
115. *SOLANUM sodomæum*.
 Sea coast by Belem.
116. *SOLANUM nigrum*.
*Caule inerme fruticoso, foliis lato lanceolatis dentato
 angulatis, pedunculis umbellatis, nutantibus.*
Leaf-stalks edged with a narrow slip, extending on
 each side down from the leaves. *Rundles* solitary,
 lateral, from three to five flowers in each.
 In many respects like *S. nigrum* of Linnæus, but the
 term *herbaceus*, applied to the stem, does not agree; it
 is often *fruticosus*, and from one half to an inch in dia-
 meter. Whole *plant*, when aged, has a black appear-

ance, particularly the berries, the upper surface of the leaves, and the branches, and it is a perennial, not an annual, so that it seems distinct from the *S. nigrum* of Linn. who possibly may have included two species under the same trivial name.

The *racemi* are not *distichi*, but *unilaterales*.

Perhaps what has been in England, called *S. nigrum*, may prove a different species.

117. RESEDA.

May be called *crispa*. *Foliis linearibus undulatis glabris, floribus trigynis*. Abbé Corrêa considers it only a curled variety of *Reseda luteola*.

Lower part of the orange ground at St. Jozè, In fields beyond Aljays plentiful, but all *foliis crispis*.

117.*CHEIRANTHUS *littoreus*.

Seems to differ from CHEIRANTHUS *annuus* in the *siliqua tomentosa*. Rocks by the side of the Tagus.

118. ANTIRRHINUM—(*orontium*?)

Foliis oppositis, lanceolato-linearibus, pedunculis axillaribus alternis. The whole plant is soft to the touch, being sprinkled with a few soft hairs. The leaves are all opposite, except the upper ones, from whose bosom the fruit-stalks proceed. Branches issuing in opposite pairs from the bosom of the opposite leaves. Edges of the leaves turned back, and their extremities ending in a semi-transparent glandular substance, from whence the species might be named *glandulosa*. Fruit-stalks, about half as long as the leaves of the calyx. Blossom pale pink, upper lip with deeper streaks, spur none. Capsule hairy.

Differs from ANTIRRHINUM *molle* in the want of downy leaves, and in having an upright stem. Approaches ANTIRRHINUM *origani-folium*, but the leaves of that species are described as egg-spear-shaped, woolly, and glutinous.

119. *PEZIZA scutellata*.

On a garden-walk.

120. *CISTUS salicifolius*.

Petals three, four, or five, yellow, with a red rust-coloured blotch near the base. *Stamens* from seven to eleven. *Antheræ didymæ*. *Shaft* thickest upwards. *Capsule* three valves and one cell. By the first fort below St. Jozè.

121. *QUERCUS coccifera*.

Two miles east of Lisbon.

122. *OPHRYS insectifera*.

In the park, near Lisbon.

123. *LAMIUM amplexicaule*.124. *EUPHORBIA falcata*.

On the sands below St. Jozè.

125. *BROMUS diandrus*. Vide 83.126. *BELLIS perennis*.

St. Jozè.

127. *POA annua*.

Road-side, below St. Jozè.

128. *SCORZONERA orientalis*.

Vine-yard, St. Jozè.

129. *ARUM sagittifolium*.

Elongated *calyx* yellow.

Linnæus gives Brazil as its habitat, but it seems at least to be naturalized in Portugal.

In the Quinta at St. Jozè, and in a lane one mile eastward.

130. *CUCUBALUS behen*.

Fields about St. Jozè.

131.

132. *SISYMBRIUM Nasturtium*.

In the brook half a mile east of St. Jozè,

133. *CYNOGLOSSUM officinale*.

Leaves softer, and *flowers* more variegated than in British specimens. Fields, St. Jozè.

134. *ANCHUSA officinalis*.

Fields and road-sides about St. Jozè.

135. *ECHIMUM vulgare*.

Road-sides.

136. *SCANDIX pecten-veneris*.

Sides of ploughed fields, St. Jozè.

137. *PLANTAGO Psyllium*.

Very viscid.

138. *SONCHUS arvensis*.

Garden-walks, St. Jozè.

139. *VALERIANA calcitrapa*.

Near St. Jozè.

140. *TRITICUM junceum*.

In a field near St. Jozè.

141. *JUSTICIA adhatoda*.

Malabar Nut. In Mr. Brander's garden, but it scarcely bears the climate.

142. *CREPIS aspera*.

Fields one mile east of St. Jozè.

143. *EUPHORBIA Characias*. β .

Scarcely different from *EUPHORBIA amygdaloides*.
Plentiful in fields about St. Jozè.

144. *ANTIRRHINUM orontium*.

Near St. Jozè.

145. *TAMARIX gallica*.

Two miles north-west of St. Jozè.

146. *RUMEX aculeatus*.

The male plant only. Near St. Jozè.

147. *BELLIS*—*spec. nov.* ?

Stem hollow, rough upwards with hairs laid flat, rather woolly at bottom, leafless, from four to twelve inches high. A specimen seventeen inches high. *Leaves* rough, hairy, indented, and toothed with glands, especially towards the base; decurrent down the leaf-stalk, full three inches long and one broad, strap-spear or spear-egg-shaped, three-fibred. *Calyx*, scales about twenty, hairy. *Florets* of the circumference white, pink underneath, either entire, or very slightly notched at the end. *Central florets* with five teeth. *Seed-buds* egg-shaped, flat, hairy. The three-fibred leaves might afford a specific difference, but the two lateral fibres are not always equally conspicuous.

On the sides of roads, and banks in corn-fields about Braço de Prata.

148. *VIOLA odorata. (cærulea.)*

Cintra. St. Jozé, in profusion.

Feb. 7, 1793.

149. *CISTUS villosus.*

Blossom white, with a yellow spot at the base of each petal. Cintra.

150. *IXIA bulbocodium.*

Cintra.

151. *POLYGALA monspeliaca.*

Ditto.

152. *PULMONARIA suffruticosa.*

Mouth without valves, but closed with many hairs. Cintra.

153. *GERANIUM scabrum.*

In a garden at Cintra.

154. *LAURUS nobilis*.

Frequent in gardens, Cintra.

155. *CYTISUS patens*.

Abbut Cintra.

156. *ULEX Europæus*.*Leguminibus hirsutis*. At Cintra.157. *ERICA* ———.*Antheris muticis, stylo exserto, floribus umbellatis.**Calyx* finely serrated with hairs; *rundles* terminating the stem and the branches; *leaves* scattered, in fours.Seems a new species; not unlike *ERICA umbellata*, but the *blossoms* are pink, and the *antheræ* not *basi-gibboso-caudatæ*. At Cintra.158. *ERICA vulgaris*.

At Cintra.

159. ——— *scoparia*.

Ditto.

160. ——— *herbacea*.

Ditto.

161. *LICHEN uncialis*.

Cintra.

162. *CHRYSANTHEMUM* ———.*Foliis lanceolatis, dentatis, inferioribus pinnatifidis.*

Cintra.

March, 1793.

163. *SCABIOSA* ———.*Corollulis quinquefidis supra hiantibus, foliis pinnatifidis serratis, calyce decaphyllo.* Firm and ligneous.
Road sides near St. Jozè.

164. *VALERIANA dioica*.
St. Jozè, and common east of Lisbon.
165. *CERINTHE major*.
In Quintas about Lisbon.
166. *BISCUTELLA auriculata*.
In the vineyard at St. Jozè, and in corn-fields east of Lisbon.
167. *CERASTIUM vulgatum*.
168. *POA pratensis*.
St. Jozè.
169. *GALIUM uliginosum*.
Near St. Jozè.
170. *CHRYSANTHEMUM corymbosum*.
Corn fields about St. Jozè.
171. *ANAGALLIS arvensis*.
Flore coccineo.
172. *ADONIS æstivalis*.
Corn-fields.
173. *TULIPA Breyniana*.
Quinta at St. Jozè.
174. *ANTIRRHINUM dalmaticum*.
Marquis de Pombal's garden.
175. *IXIA scillaris*.
Ditto, and fields about Braço de Prata.
176. *PLANTAGO coronopifolia*.
About Oeyras.
177. *BRIZA virens*.
At Oeyras.
178. *DACTYLIS* ———?
At Oeyras, but rare,

179. OROBANCHE (*purpurea.*) Linn. Suppl.

Caule ramoso, corollis bilabiatis, calycibus quadrijidis, staminibus inclusis.

Anthers with a projecting point at the base.

Blossom yellowish white. Corn-fields, St. Jozè.

180. ALLIUM *roseum.*

Petals imperfect at the end, but not always evidently notched. Oeyras.

181. SINAPIS *lævigata.*

Ditto.

182. ANDRYALA *lanata.*

In the vineyards at Oeyras.

183. MALVA *sylvestris.*

Outer *calyx leaves* strap-shaped. Vineyards at Oeyras.

184. OXALIS *corniculata.*

Filaments firmly and broadly connected at the base. Garden of the Ajuda palace, and at Braço de Prata.

185. HORDEUM *murinum.*

Oeyras. Common by road sides and on walls.

186. ERYSIMUM *officinale.*

Road sides.

187. TILLÆA *muscosa.*

Garden walks at Grillo, the Duke de la Foen's.

188. RHAMNUS *alaternus.*

On the east of Lisbon, plentiful.

189. HYACINTHUS *comosus.*

Fields east of Lisbon.

190. ILLECEBRUM *paronychia.*

Road sides east of Lisbon.

191. POLYPODIUM *leptophyllum.*

On walls to the east of Lisbon.

192. *POLYCARPON tetraphyllum.*

Three miles east of Lisbon.

193. *TRIFOLIUM melilotus.*194. *LUPINUS angustifolius.*

Corn-fields about St. Jozè.

195. *POLYPODIUM vulgare.*

Hollow-ways.

196. *PHILLYREA angustifolia.*

Mount at Braço de Prata.

197. *ASPLENIUM adiantum-nigrum.*

Lime-rocks, sea-coast, Braço de Prata.

198. *LONICERA caprifolium.*

Flowers in a round cluster rather than a regular whorl.

Lower leaves distinct.

199. *BOLETUS unicolor*

Stumps of trees. Mount at Braço de Prata.

200. *CYNOSURUS aureus.*

The *awn* rising from near the base of one petal, and from near the end of the other. Near the Grillo.

201. *HYOSERIS Hedynois.*

Fields near Braço de Prata.

202. *OLEA Europæa.*

The *Olive*, in its wild state, has the ends of its branches terminating in long taper *thorns*, but the ingrafted Olive has none. The *fruit* of the former is much smaller and less pulpy than that of the latter. When the wild Olive is allowed to grow up, and to form a large timber-tree, it loses its thorns.

203. *ARUM maculatum.*

Elongated *receptacle* yellow. *Leaves* with yellowish blotches.

204. *DOLICHOS lignosus*.

At Val Formosa, near Braço de Prata.

205. *VICIA sativa*.

Common about Braço de Prata.

206. *ANDROPOGON hirtum*.

The two fleshy glandular top-shaped substances found within the valves at the base of every floret, whether hermaphrodite or not, form a characteristic hitherto unnoticed. Plentiful about Braço de Prata.

207. *LYCHNIS dioica*.

Braço de Prata.

208. *ORCHIS militaris*.

About Braço de Prata.

209. *SILENE gallica*.

Ditto, common.

210. *CRATEGUS Monogyna*.

Ditto.

211. *SOLANUM melongena*.

In gardens.

212. *CORONILLA coronata*.

Quinta at Braço de Prata.

213. *GERANIUM moschatum*.

Emitting a very strong smell of musk. Plentiful about Braço de Prata, and St. Jozè de Riba Mer.

214. *MEDICAGO polymorpha*, (*ciliaris*.)

Leaves serrated. Road sides. Braço de Prata.

215. *CISTUS polifolius*.

Shrubbery at Braço de Prata.

216. *PISTACHIA lentiscus*.

Stamens five or six, and sometimes the rudiments of a Pistil in the barren plants. In hedges and rough places about Braço de Prata, plentiful.

217. *VALANTIA aparine*.

218. *LATHYRUS setifolius*.

Braço de Prata.

219. *CERINTHE major*. Vide 104.

Anthers double: two tendrils, or *filaments*, at the base of each, which mutually intertwine with those on each side of them. This structure also prevails in the genus *ONOSMA*, as remarked to Linnæus by the Abbé Corrêa da Serrá, who advised that the genera should be consolidated. M. L'Heritier has since observed the same. Vineyard at Braço de Prata. Var. β . South of the Tagus, opposite to St. Jozè.

220. *SCORPIURUS sulcata*.

Vineyards about Braço de Prata.

221. *TAMUS communis*.

Braço de Prata.

222. *GERANIUM*—*maritimum*?

vel ciconium?

vel nova species?

*Foliis radicalibus ovato-lanceolatis, crenatis; com-
linis pinnatifidis, segmentis acute-incisis.* Braço de
Prata.

223. *ARENARIA rubra*.

Ditto.

224. *PISUM ochrus*.

Ditto.

225. *CAMPANULA persicifolia*.

226. *ORCHIS morio*.

About the mount at Braço de Prata: end of February.

March, 1793.

227. *NIGELLA damascena*.
Corn-fields east of Lisbon.
228. *SERAPIAS grandiflora*. Var. β .
Since designated, *Serapias ensifolia*.
Mount at Braço de Prata.
229. *LA VENDULA Stæchas*.
Plentiful about Braço de Prata.
230. *ORNITHOGALUM umbellatum*.
Vineyard at Braço de Prata. Fields two miles north of St. Jozè.
231. *PINUS sylvestris*.
Grows to a very large size.
232. *QUERCUS coccifera*.
Glandibus pedunculatis.
Stamens five. Segments of the calyx five.
Very common.
233. *VICIA lutea*.
The upper leaf-scales have each a dark spot upon them as in *Vicia sativa*. Leaf-scales black underneath.
Mount at Braço de Prata, and on the south side of the Tagus.
234. *ULEX Europæus*. Var. α .
A much more elegant plant than the common British species; the blossoms so much smaller that it might be named *parviflorus*, *petala lineata*. Calyx-leaves as long as the blossom; not woolly. Pod hairy on the upper part. Thorns very much branched, neither they nor the leaves at all woolly. Seeds six in each pod.
Alcantara valley, and common about Lisbon.
235. *SCORZONERA picroides*.
Mount at St. Jozè Quinta.
236. *ANEMONE palmata*.
Under hedges and banks of corn-fields about Braço de Prata.

237. *LICHEN pyxidatus*. Var. *δ. fimbriatus*.
In a shady lane near Braço de Prata.
238. *AURICULARIA reflexa*.
On a stump in the mount at Braço de Prata.
239. *TURRITIS hirsuta*.
About Braço de Prata.
240. *TRAGOPOGON picroides*.
About Braço de Prata, but not plentiful.
241. *POTERIUM* ———.
-

April, 1793.

242. *LATHYRUS sativus*.
Braço de Prata.
243. *LICHEN parietinus*.
On sticks and trees, plentiful.
244. *LUPINUS angustifolius*.
Braço de Prata.
245. *GALIUM parisiense*.
Fructu papilloso.
Road-sides, Braço de Prata.
246. *ANTIRRHINUM majus*.
About the village of Olivaes, and at Braço de Prata.
247. *VERONICA Beccabunga*.
In a brook near Olivaes.
248. *LEONTODAN tuberosum?*
249. *BISCUTELLA lævigata*.
About Braço de Prata.
250. *TRIFOLIUM stellatum*.
The *calyx* less open than is generally observed in that species.

251.

252. *PLANTAGO serraria.*

Near Olivaes.

253. *CHENOPODIUM album.*

About Braço de Prata.

254. *RUMEX aculeatus.*

Corn-fields about Braço de Prata.

255. *ANTHYLLIS vulneraria.* Var. β .

Filaments forming at the top a hollow bladder, like an inverted pyramid; the *anthers* fixed to the central part of the base of the pyramid.

Braço de Prata.

256. *STACHYS arvensis.*

Corn-fields, commons.

257. *ANTIRRHINUM chalepense.*

About Braço de Prata.

258. *CAMPANULA erinus.*

On walls.

259. *CISTUS guttatus.*

Mount at Braço de Prata.

260. *CHRYSANTHEMUM coronarium.*

In corn-fields, very common.

261. *GNAPHALIUM luteo-album.*

On rocks near the river Tagus.

262. *ANCHUSA italica.*

Corn-fields about Braço de Prata.

263. *SONCHUS oleraceus.* β .

Ditto.

264. *AVENA fatua?*

Panicle pointing one way.

Calycibus bifloris.

About Braço de Prata, common.

265. *HIERACIUM alpestre*.
 266. *PHALARIS canariensis*.
 267. *AIRA caryophyllea*.
-

May.

268. *THELIGONUM cynocrambe*.
 Near Braço de Prata, in the fences of the Agave.
 269. *SEMPERVIVUM arboreum*.
 On walls.
 270. *CAMPANULA erinus*.
 On walls at Braço de Prata.
 271. *HYPERICUM perforatum*.
 Braço de Prata.
-

December.

273. *AGARICUS campestris*.
 274. ——— *tenuis*.
 275. ——— *integer*.
 276. ——— *semi-ovatus*.
 277. ——— *eburneus*.
 278. ——— *dulcis*.
 After much rain, succeeded by warm and very moist
 fogs.
 279. *BYSSUS phosphorea*.
 On decayed wood.
 280. *AGARICUS bulbosus*.

281. *AGARICUS collariatus*.
 282. ——— *Hypni*.
 283. ——— *clypeolarius*.
 284. ——— *furfurosus*.
 285. ——— *umbelliferus*.
 After a wet and foggy season.
 286. *ASPARAGUS acutifolius*.
 In hedges about Braço de Prata.
 287. *SMILAX aspera*.
 Hedges and copse at Braço de Prata. In fruit, common.
 288. *DAPHNE Gnidium*.
 Flowers in August. Common in hedge-banks.
 289. *VERBASCUM sinuatum*.
 Flowers almost all summer. In the copse at Braço de Prata.
 290. *CYPERUS flavescens*.
 Not uncommon.
 291. *PHALARIS canariensis*.
 Very frequent in summer.
 292. *ORNITHOPUS perpusillus*.
 Braço de Prata. In summer.
 293. *SANQUISORBA officinalis*.
 Ditto. Ditto.
 294. *LAVATERA trimestris*.
 Ditto.
 295. *TRIFOLIUM arvense*.
 296. ——— *fragiferum*.
 About Braço de Prata and St. Jozè.
 297. *ARUNDO donax*.
 Flowers in summer. Sides of the Tagus, near Braço de Prata. Of the greatest utility for making fences and

screens in gardens, forming espaliers, &c. It is cultivated for such purposes in most of the Quintas.

298. *DAUCUS carota*.

Fields about Braço de Prata.

299. *CORRIGIOLA littoralis*.

Calyx very like the blossom, but the segments towards the base of a rich chestnut brown. The whole flower, and more particularly its seed and its pistils, nearly resembling the *Polygonum*. It blossoms all the year. Grows frequently in ploughed fields; and very plentifully on the shores of the Tagus, and on the hedge-banks and lanes in its vicinity.

300. *BYSSUS candida*. Var.

Very short, and fine as wool. Common on moss in hedge-banks.

301. *PEZIZA scutellata*.

Hedge-banks on stiffish soil.

302. *AGARICUS macer*. Var. 2.

303. *NIDULARIA campanulata*.

304. *AGARICUS (nova species?)*

Gills fixed, pure, buff, few, four in a set. *Pileus* dead brownish watery white, nearly flat, edge turned down; four to six tenths of an inch in diameter. *Stem* hollow, white, cylindrical, thick as a large pin, three quarters to one inch high. *Root* an irregular fleshy knob.

Amongst dead leaves and sticks in the copse at Braço de Prata, after much rain.

305. ——— *corrugatus*.

Copse at Braço de Prata.

306. *PEZIZA cochleata*.

307. *LICHEN pyxidatus*.

308. *AURICULARIA reflexa*.

309. *AGARICUS turbinatus.*

Quinta of Val Formosa.

310. *ACHILLEA ageratum.*311. *AGARICUS (nova species?)*

Gills fixed, yellow, four in a set, not very numerous.

Pileus convex, bright orange, half an inch over. *Flesh* yellow. *Stem* solid, cylindrical, bright orange, one and a half inch high, thick as a small crow-quill. The whole plant semi-transparent, and very beautiful, from the brilliancy of its Aurora tints.

On a hedge-bank, after much rain.

312. *AGARICUS ligatus.*313. *QUERCUS cocciferus.* Kermes Oak.

Grows plentifully in the copse at Braço de Prata, and overspreads large tracts of barren heaths in Portugal. The fruit varies much in shape and size.

314. *TREMELLA granulata.*

On shady hedge-banks, amongst moss, after much rain.

315. *AGARICUS circumseptus.*316. ——— *obesus.*317. *CONYZA saxatilis.*

The cottony fibres are made into tinder.

Very common on walls and hedge-banks.

318. *BUPLEURUM.*

A species not noticed by Linnæus, approaching *B. fruticosum*. It is rightly described by L'Heritier.

Very common in hedges about Braço de Prata.

319. *AGARICUS (nova species?)*

Gills rich yellow brown, thin, and rather transparent, irregularly four in a set, some of the long ones decurrent.

Pileus rich yellow brown, opaque, concave, four inches wide, three inches broad. *Flesh* thin. *Stem* lateral,

rich yellow brown, full one inch long, nearly half an inch diameter, tapering downwards, solid, flesh the colour of rhubarb.

On a hedge-bank, in a cluster, after a wet season.

320. *AGARICUS extinctorius*.

In a ploughed field.

January, 1794.

321. *CARDANİME petraea*.

On walls near Braço de Prata, and on rocks by the sea side.

322. *ATRIplex laciniata*.

Sea shores and hedges near the Tagus.

323. *CLAVARIA coralloides*.

Amongst dead leaves and sticks in the garden at St. Jozè.

324. *HELVELLA mitra*.

Copse at Braço de Prata.

325. *THLASPI saxatile*?

326. *SENECIO vulgaris*.

Very common.

327.

February.

328. *AGARICUS melleus*.

Ploughed field, near St. Jozè.

329. *LINUM* —.

Garden walks, St. Jozè.

330. *NARCISSUS Tazetta.*

Blossom white; *leaves* rather strap than oval-shaped.
Nectary, its upper concave part about one-third the
length of the petals.

Meadows about St. Jozè in great profusion.

331. *LITHOSPERMUM arvense.*

About St. Jozè de Riba Mer.

332. *HEDYSARUM humile.*

Fields about St. Jozè.

333. *PAPAVER argemone.*

Ditto.

334. *GERANIUM columbinum.*

Garden-walks, St. Jozè.

335. *AGARICUS semiglobatus.*

In the salt-marsh on the south side of the Tagus.

336. *AGARICUS coronatus.* Var. 1.

Near the preceding.

337. *SILENE cerastoides?*

The length of the *peduncle* varies very much. The
calyx is cylindrical till the seed ripens, and the *capsule*
is of one cell only, in which points it differs from the
essential generic character. Sandy waste on the south
shore of the Tagus, opposite St. Jozè.

338. *JUNCUS acutus.*

Salt-marsh on the south side of the Tagus.

339. *SENECIO ~~equalidus~~ ?*

Scales of the *calyx* very little discoloured at the ends.
South side of the Tagus.

340. *GERANIUM malacoides.* Vide No. 7. Is it
the same plant?

Petioles *oppositi, altero breviores*, which, as Linnæus
remarks, is a striking circumstance, as the stalks of
opposite leaves are so very generally of equal length.

341. *GERANIUM columbinum.*

Petals cloven, ten perfect *stamens*; ten green *glands* at their bases. The plant rather harsh and rough to the touch. Quinta at St. Jozè.

342. *GALIUM aparine.*

The ripe seeds roasted make good Coffee. The Abbé Corrèa remarks that it has a natural affinity to the Coffee-plant. In the garden of the Convent of St. Jozè.

343. *ARTEMISIA crithmifolia.*

Barren sands and salt-marshes, south of the Tagus.

344. *GERANIUM pimpinellifolium.*

Upper walk in the Quinta, at St. Jozè.

345. *CACTUS opuntia.*

In hedges on the south side of the Tagus.

346. *CAMPANULA glomerata.*

In corn-fields about St. Jozè.

347. *SCILLA peruviana.*

On a piece of turf-land by the side of the brook, about one mile and a half north of St. Jozè.

March.

348. *GERANIUM dissectum.*

Fields north of St. Jozè.

349. *GERANIUM cicutarium.*

Ditto.

350. *CHRYSANTHEMUM Myconis.*

Ditto.

351.

352. *FICUS carica.*

Going into leaf: the plant in its wild state. *Leaves* of the first year cordato-lanceolate, constituting the *Ficus morifolium* of Tournefort's Herbarium. Leaves of the second year trilobate, and those in the older plants still more deeply divided, and quinquelobate: according to the observation of the Abbé Corrêa.

353. *HYOSERIS rhagadioloides.*

At Alcantara, near Lisbon.

354. *HYOSERIS hedynois.*

Seeds of the central florets crowned with a skinny membrane, fibrous at the edge, having from one to five extended fibres. In the valley of Alcantara.

355. *ANCHUSA undulata.*

Ditto.

356. *PHLOMIS lychnitis.*

Calcareous rocks at Alcantara.

357. *ASPARAGUS albus.*

Several varieties of this plant grow in the valley of Alcantara.

358. *ASTRAGALUS Glaux?*

Garden-walks at St. Jozè, lying close to the ground.

359. *RANUNCULUS sceleratus.*

Near the brook at St. Jozè.

360. *SPARGANIUM natans.*

Some *leaves* floating on the water, others quite upright. *Root*, bright orange red. In the brook near St. Jozè.

361. *SALIX alba.*

Brook-side, north of St. Jozè.

362. *GLADIOLUS communis.*

Fields above Aljays.

363. *LEONTODON hispidum*.
Hairs very slightly forked. Stem none. Peduncles from the root. North-east of St. Jozè.
364. *TRIFOLIUM fragiferum*.
Garden-walks, St. Jozè.
365. *POA aquatica*.
Brook, near St. Jozè.
366. *TRAGOPOGON picroides*.
Intensely bitter. At St. Jozè de Riba Mer.
367. *TRIFOLIUM agrarium*.
The two upper segments of the *calyx* very short: the other three very long, and threadshaped, the two side ones rising up so as to embrace and almost surround the standard of the blossom. St. Jozè.
368. *OPHRYS anthropophora*.
In the Quinta next to the Convent of St. Jozè.
369. *BUPLEURUM rotundifolium*.
Corn-fields about St. Jozè.
370. *MEDICAGO polymorpha*.
In corn-fields, and by road sides.
371. *HIPPIA lusitanica*.
In garden-walks, and other dry stiff soil.
372. *SILENE nocturna*.
Flowers expand about sun-set, and then appear of a pinky white. In the day time the limbs of the petals are twisted spirally, and almost withdrawn into the calyx, then appearing shrivelled, of a dirty lead colour, with a dull tinge of pink. They are either sessile or on fruit-stalks. The curled-up petals expand when put into water. Leaves, lower ones spear-egg-shaped; upper ones spear-shaped, but none of them rigid and concave, as mentioned by Reichard. The plant is not viscid, and only very slightly hairy.

373. *CHRYSANTHEMUM segetum*.

Corn-fields, common.

374. *TRIFOLIUM resupinatum*.375. *OPHRYS insectifera*. 1.*Orchis Myodes lutea lusitanica*.

376.

Orchis Myodes fusca lusitanica.

377.

Orchis araneam referens.378. *ORCHIS globosa*.

Has a sweet smell. From Cintra.

379. *ALLIUM magicum*.

A single *bulb* between the inner leaf and the stem. This bulb is at the end of a flat, strap-shaped *pedicle*, the base of which entirely surrounds the *scapus*, and probably descends to the root. In fields north of St. Jozè, very plentiful.

380. *STACHYS hirta*.

Stem more properly ascending than prostrate. Fields about St. Jozè.

381. *MARRUBIUM vulgare*.

Common about St. Jozè.

April.

382. *GENTIANA Centaureum*.

Ditto.

383. *LOTUS corniculatus*.

Near Cashiers.

384. *OROBANCHE major*.

In fields near St. Jozè.

385. *ECHIMUM violaceum*.

Ditto.

386. *CENTAUREA galactites*.

Outer florets with four or five strap-shaped segments.

Feather downy. Fields and banks, St. Jozè.

387. *ANTIRRHINUM orontium?*

Calyculus vix coralla longioribus: foliis oppositis, sessilibus, semi-amplexicaulibus. Some of the upper leaves in the taller plants are alternate. Flowers sessile, terminating, white, with streaks of red within. Vide No. 118.

Whole plant smooth, except a few scattered hairs on the calyx, and a fine fringe at the base of the leaves on the edge which spreads upon the stem. Fields at St. Jozè.

388. *DAUCUS muricatus*, var. β .

The whole plant rough with stiffish hairs, mostly pointing downwards. Those on the young seeds terminating in white transparent globules. In a field north-east of St. Jozè, in rich soil formed of calcareous earth and decomposed lava.

389. *VICIA (nova species?)*

This plant differs from *VICIA sativa* in the flowers being solitary; from *VICIA lathyroides* by the hairy, and from *VICIA lutea* by the upright, pods. *Stipulæ* marked as in *VICIA sativa*. *Standard* smooth, yellowish white, with crimson lines, and a blush of crimson towards the base. *Wings* pale yellow. *Pods* densely set with hairs, four seeds in each. *Stem* and *leaves* hairy. Common in fields, and by the road sides about St. Jozè.

390. *TRAGOPOGON Dalechampii*.

Ditto.

391. *BUPHTALMUM spinosum*.

Fields two miles north of St. Jozè.

392. *TRAGOPOGON porrifolium*.

Corn-fields at St. Jozè.

393. *ANTHEMIS valentina*.

Ditto.

394. *VICIA* ———.

Agrees best with *VICIA oracca*, but only one of the *stipulæ* is entire; this is spear-shaped; but the opposite one is toothed at its base, so as to be nearly halberd-shaped. The lower pairs are both toothed at the base. Fields, St. Jozè.

395. *DACTYLIS glomerata*.

In the court-yard at St. Jozè.

396. *ASTRAGALUS Glaux*.

In the fields. Vide 358.

397. *MALVA rotundifolia*.

Calyx, outer leaves deeply divided, spear-shaped. *Blossom* fully thrice as long as the calyx. *Stem* prostrate. Very common.

398. ——— *sylvestris*.

Calyx, outer leaves narrow, strap-shaped. *Blossom* but little longer than the cup. *Stem* upright. *Calyx* leaves divided quite down to the base. Common. Vide 183.

399. *MALVA* ———.

Nearly allied to the *MALVA parvi-flora* of Linnæus, but differing therefrom in having *seed-coats*, (not wrinkled at the top and dentated on the sides, but) woolly and smooth; nor are the flowers sessile. A common plant.

400. *ANETHUM fœniculum*?

General fence one bristle-shaped leaf. A glaucous appearance on the plant, which readily rubs off.

Fields about St. Jozè.

401. *MEDICAGO polymorpha*. δ . *turbinata*. γ .
ciliaris.

402. *LATHYRUS latifolius*.

About St. Jozè.

403. *CYNOGLOSSUM linifolium*.

Leaves quite smooth underneath, very rough above, with short white bristly hairs rising out of glandular papillæ; edges toothed with longer white hairs.

Fields, St. Jozè.

404. *CAMPANULA erinus*.

Blossom longer than the cup.

Ditto.

405. *FESTUCA* ———.

Nearest to *Festuca juncea*, but may prove a new species.

406. *POA rigida*.

About St. Jozè.

407. *TRIFOLIUM pratense*.

Ditto.

408. *ACANTHUS mollis*.

Near the brook north-east of St. Jozè.

409. *CAMPANULA erinus*.

Fields near St Jozè.

410. *ECHIUH lusitanicum*.

Leaves feel like velvet. *Stem* cylindrical, its *hairs* very white, pellucid, and flat, as are those on the leaves.

411. *BROMUS erectus*.

Six to eight *florets* in each spicula. No part of the plant either hairy or downy. *Spikets* from one to six on each straw.

412. *BROMUS mollis*.

Seven *florets* in each flower. *Awns* shorter than the husk. *Spikets* covered with soft hairs.

413. *GNAPHALIUM arenarium*.

Fields near St. Jozè.

414. *CHENOPODIUM viride*.

Ditto.

415. *CONVOLVULUS arvensis*.

Corn-fields.

416. *RANUNCULUS aquatilis*.

Brook near St. Jozè.

417. *TRITICUM repens*.

But instead of four *florets* only in each empalement, it has nine or ten, thus far resembling the *Triticum maritimum*.

St. Jozè.

418. *PHALARIS paradoxa*.

Not uncommon about St. Jozè.

419. *AVENA fatua*.420. *ARUNDO calamagrostis*.

In the garden and fields about St. Jozè.

421. *SISYMBRIUM Irio*.

In the vineyard at Boullenois' Hotel, Calçada d'Estrella, Lisbon.

*Plants observed in an Excursion from Lisbon to
the Caldas da Rainha.*

CHELIDONIUM *majus*.

BELLIS *major*.

On the most barren commons, and often on the same spot with the *BELLIS perennis*; but seems to be a distinct species, and may be characterised thus,

Bellis scapo nudo, foliis trinervis, hirsutis.

QUERCUS *suber*.

FRAXINUS *excelsior*.

Much later in leafing than about Lisbon.

PINUS *sylvestris*.

Forests of it near the Caldas.

ASPHODELUS *ramosus*.

Leaves three feet high, shaped and keeled like a small sword; more than one inch diameter at the base.

CENTAUREA *sonchæfolia*.

Near the Caldas.

CONVALLARIA *multiflora*.

RUBUS *fruticosus*.

MYOSOTIS *scorpioides*.

In marshes near the Caldas.

POLYPODIUM *vulgare*.

AGARICUS *integer*.

In the Pine woods.

LEONTODON *taraxacum*.



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1792, 1793, and 1794.

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NOTES

Relative to the

NATURAL HISTORY OF PORTUGAL,

BY THE

EDITOR.

THE Domestic Fowls are the same as those of Spain, entirely black, and remarkable for their white ears and large red combs.

Starlings, (*STURNUS vulgaris*,) innumerable flights of them frequent the olive-grounds in the months of January and February.

Fieldfares and **Redwings**, (*TURDUS pilaris* and *T. iliacus*,) are likewise to be seen in large flocks in the early part of the year.

TETRAO rufus, the large red-legged species, is the prevalent kind of **Partridge**. In the royal preserves, near Lisbon, they abound, and are surprisingly tame.

The species of **Owl**, (*STRIX passerina*,) often to be observed perched in the orange-trees, is very diminutive, being not much larger than a Blackbird.

A multitude of **Sea-fowl** frequent the adjoining coast, and the shores of the Tagus, but do not appear materially to differ from those in more northern latitudes, such as **Cormorants**, **Puffins**, **Larks**, **Swallows**, &c.

On the southern side of the river lies an extensive tract of

marshy ground, from which the market of Lisbon is abundantly supplied with *Woodcocks*, *Snipes*, *Wild Ducks*, and *Geese*.

The several species of *Swallows*, never wholly disappear through the winter. On the coldest days they were observed on the wing under walls of a sunny aspect.

The Tagus produces,

ACTINIE, (*Flower Fish*, or *Sea Anemone*,) in great variety, and of most beautiful colours and diversified forms.

These animals are viviparous, feed on shell-fish secured by numerous *tentaculæ*. They eject the shell through the same orifice by which their prey has been admitted. The *tentaculæ* when fully expanded resemble a splendid vegetable, and have been not inaptly compared to a China Aster or Anemone.

Several were preserved in basins of water, and fed with small pieces of fish. The colours presented in different lights and shades are changeable as those of the Chamelion, green, red, striped, brown, white, pink, or orange.

MEDUSA cruciata. (*Jelly Fish*.)

Usually resembles a mass of transparent colourless jelly, but under a full sun appears to glow with all the colours of the rainbow.

These Molluscæ are said to swim in large companies, with their *tentaculæ* distended, in search of food, which consists of insects and small fishes.

ASTERIAS ophiura. (*Sea Star*.)

The mouth is constructed of five valves, each armed with a tooth, to break shells and other matters upon which it preys. Upon each ray are innumerable feet, by which it adheres to rocks and other places of its repose. These rays are brittle, but when broken grow again, as do Lobsters' claws.

ECHINI marini. (*Sea Urchins*, or *Hedge-hogs*.)

Several kinds, generally small, and of a violet or brown colour, may be picked up on the sands. The spines with which the orbicular shell is covered, and often exceeding a thousand in number, are considered to be feet, by which is exercised a locomotive power. The plunging of these animals to the bottom of the water, (where they, as it were, cast anchor with their *tentaculæ*,) is deemed to prognosticate tempestuous weather.

The flesh of *E. esculentus* is said to be eaten in France.

LEPAS balanus. (*Sea Acorn.*)

Found in large clusters attached to rocks; colour white, purple, or brown.

SOLEN. (*Razor Sheath.*)

The shell is composed of two straight valves, from two to six inches in length, and from one quarter to one inch in breadth. The smaller, (*S. ensis*,) display stripes of purple and brown; the larger, (*S. siliqua*,) are more uniformly pale brown. They probably live by suction, buried in the sand, often appearing above the surface, but rarely to be taken in a live state, having the power of swiftly withdrawing themselves to more than a foot under ground.

PINNA fragilis. (*Sea Wing.*)

A curious bivalve, not very common; colour brown, within finely polished.

OSTREA edulis. (*Oyster.*)

Not indigenous to the Tagus; but a rough, tuberculated sort have been propagated therein, and may be observed adhering to the rocks at low water.

What may be considered the *Oyster* of the Tagus is the *ANOMIA ephippium*, a bivalve, flat on the under side, convex above, plain brown outside, within resplendent with purple hues.

Muscles, Crabs, Scallops, and Periwinkles, abound.

Of fishes, those in most common use for the table are,

The *Pardo*, somewhat resembling a Carp, but larger.

The *Bonets*, the size and figure of a Salmon, generally taken in the ocean.

Turbots, remarkably fine, but not esteemed by the Portuguese.

Dorys, equally excellent, but of trifling value, and seldom brought to the tables of the luxurious.

The *Sardinha*, resembling the *Pilchard*, constitutes a principle article of food with the lower orders, who may be seen daily frying them in rancid oil in the streets of Lisbon, over *Fogoraros*, (chafing dishes,) in which the fire is kept alive by the incessant application of a fan of rushes. Chestnuts are roasted in the same manner.

When *Porpesses* appear in the river, stormy weather is expected.

TRACHINUS *Draco*. Linn. DRACO *marinus*. Pliny. (The *Weever*, or *Sea Dragon*.)

A small fish not more than three inches in length, of bright colours, and armed with spines, capable of infusing a poison which excites most acute pain, succeeded by numbness of the limb affected, and continuing several days; as the writer can testify, having heedlessly taken one in his hand, to the consternation of the fishermen by whose net the formidable little animal had been dragged ashore.

A non-descript fish which abounds, but is reckoned coarse food, measures from three to five feet in length, three to four inches across, with flatted sides, and not unlike an immense Eel in general proportions. The skin is free from scales, and of a shining silvery hue.

SYNGNATHUS *barbarus*. Linn. *Acus* of Aristotle. (*Sea Needle*, or *Pipe Fish*.)

From one to two feet in length, slender as a large quill, of a brown colour, with the nose turned upwards.

The warm suns of this climate produce a rich harvest to the Entomologist, the insect tribes being splendidly attractive.

SCARABÆUS *Hispanus*, Linn. (*Portuguese Rhinoceros*,) was found near St. Jozè de Riba Mer, in February, 1794.

It is a large black beetle, bearing a remarkable incurvated horn upon its forehead.

"*Rhinoceros Lusitanicus niger splendens*." Pet. Gaz. t. 8. f. 4.

MELOE *proscarabæus*, (*Oil Beetle*,) of a dead black colour, prefers moist situations: feeds on lesser insects, violet leaves, and other tender herbs. A fat, unctuous matter, of no disagreeable smell, oozes from its body.

GRYLLUS *grossus*, (the *Locust*,) varying in colour from brown to a greenish hue, and also much differing in size, is frequently met with, especially on the sandy desert of the Costa, south of the Tagus, a hot-bed for their production, where myriads may be seen ready to issue forth in devastating columns.

—— *grillo-talpa*, (*Mole Cricket*,) justly described as the most hideous of its congeners, performing a nocturnal concert of chirp, or monotonous burr, in almost every Quinta.

It is furnished with five eyes placed transversely in one line; the *thorax* forms a strong cuirass; its fore feet are broad and large, terminating in serrated claws, well calculated for excavating the earth, into which it burrows with wonderful rapidity, ravaging the roots of plants for food. The whole animal is of a dusky brown colour. It is seldom seen on the wing, and is difficult to take.

MANTIS *gongylodes*, a most singular little creature, beheld with veneration both in Europe and Asia. As its generic name imports it is considered as a *Soothsayer*, possessing the power of divination, and indicating the right direction to bewildered travellers. It frequently rests on its four hind legs only, joining its two fore ones together in an erect position, and thence is sometimes called *Praise-God*, to which may be added *Bare-*

bones, having little or no flesh to cover it. In Languedoc it likewise obtains the name of *Prègadiou*.

It measures scarcely two inches in height, is of a brownish colour, is not thicker than a straw, has a pair of prominent shining eyes, with the head awl-shaped, or somewhat resembling that of a stag. Two or three specimens were procured, but not without difficulty, both from their scarcity and the superstitious veneration in which the animal is held.

SCOLOPENDRA forficata, (*Fork-tailed Milleped*,) has fifteen feet on each side; is of a dun colour, and frequents houses. From every portion of its body, when severed in pieces, *Polypus* like, a new Milleped is produced.

APIS violacea, (*Blue Bee*.) A beautiful insect which dwells and propagates its species in the large Portuguese reed, (*Arundo donax*,) growing on the shores of the Tagus, near Braço de Prata, and in other places above.

Its body is black, covered with soft hairs, having four transparent wings of a rich purple colour.

"*VESPA in ramis arborum nidificans*." This singular *Wasp* fabricates a nest, or comb, of wood, reduced to paper, varnished in a manner impenetrable to water, and not altogether larger than a walnut. The nest is usually fastened by a kind of stem, attached to some little twig of a bush or tree; hence these insects are denominated *Aerial Wasps*. They are smaller than any other species, and build early in the year. My specimens were found on a Rosemary bush, at St. Jozè.

CULEX pipiens, (the *Musquito*,) is almost equally prevalent with *Pediculi* and *Pulices*, particularly in towns during the hot season.

This fly much resembles the common Gnat, but the poison injected by it is found to be more virulent, and is probably augmented by the heat of the climate. Volatile Alkali, or Fuller's earth and water, have been advised as the best applications to allay the intolerable itching and inflammation.

Beds are generally protected by a covering of thin net or wove silk, having the appearance of striped gauze.

The common window *Flies* may be readily destroyed by closing the shutter, or applying any other board to the glass on which they swarm. The heat of the sun will produce an instantaneous and general *coup de soleil*.

The wonderful economy of the FORMICA, (or *Ant*,) may be advantageously studied in Portugal, where several species are observable in a far more animated state than in the north of Europe. In the months of March and April their exertions, moving in long and regular columns, one line laden with winter stores for the colony, and the other returning empty, but with equal order, for fresh supplies, will be viewed with admiration.

Ants are liable to the assault of some deadly enemy, thousands of them sometimes being found recently killed, and lying near the entrance to their nether abodes.

In their own personal contests they have been known to fight with inveterate fury; to continue the combat not only with the loss of limbs, but when still more vital parts have been injured; nor will they desist till by the most persecuting vengeance, the conqueror absolutely annihilates, or finally devours his antagonist.

Similar contests have been observed in the *Mantis* tribe, even between individuals of different sexes, in which the female, as in most insects, being the larger and more powerful, has enjoyed not only a deadly, but a voracious triumph over her mate!

Snails. It may be remarked that the few vegetable productions of the extensive sands on the south side of the Tagus, are incrustated with a species of small Snail. Such is also stated to be the case in the desert of Zara, by African travellers.

LACERTÆ, (*Lizards*.) Several species are very common; the larger kinds basking near the entrances of their retreats in warm sandy banks; the smaller creeping upon the sides of stone walls: all perfectly innocuous, though some of the brown, verrucose sort, have a repulsive aspect.

The small green Lizards, striped with gold, (*L. agilis, viridis*, and *vulgaris*,) are elegant little creatures; but those measuring from eighteen inches to two feet in length, appear formidable from their size, and having no external ears, the large circular orifices add considerably to their ugliness.

These reptiles possess the power of instantaneously casting off their tails, so that when seized by that part, the naturalist seldom obtains more than the elongated, and animated portion. The deficiency is quickly supplied by a new protrusion.

COLUBER *Berus*, Linn. (*Adders* or *Vipers*,) are found among the dry rushes of the Costa.

A nondescript species of the same genus, measuring three feet and nine inches in length, was taken in the Quinta of St. Jozè. An older one of this kind died in consequence of being gorged with a young rabbit.

STATISTICAL AND MISCELLANEOUS

NOTICES

RELATING TO

PORTUGAL.

The AQUEDUCT at Lisbon is continued from the Riberia de Caranque, for a space of ten miles and a half, to Lisbon. It is carried on arches over the valleys, and by subterranean passages through the hills. Across the Valley of Alcantara,* one mile and a half from Lisbon, it is supported by thirty-five arches, and these are the most magnificent; but the whole number of arches is one hundred and twenty-seven.

The set of arches across the Valley of Alcantara, extends eight hundred and twenty-one yards; the height of the principal arch is somewhat more than seventy-five yards, and its breadth or width thirty-six yards. The water flows in two channels, each twelve inches wide, and twelve inches deep, the bottom rounded; but the depth of water in these channels is only about seven inches. Between these channels is a walk, or footpath, paved with fine stone. The whole is arched over, the covering arch being thirteen feet high. The duct is lighted and ventilated by means of turrets or square towers, with latticed windows, and occasional doors to admit workmen when any repairs are wanted. There are sixteen of these turrets across the Valley of Alcantara, each of which rises twenty-

* *Al-cantara*, the bridge: (Moorish.)

three feet and a half above the roof of the Aqueduct ; and on the outside of the enclosing walls is a footpath, one on each side, about five feet wide, reaching quite across the Valley, and rendered secure by a parapet-wall of a proper height.

This work was but little damaged by the great earthquake in 1755. It was begun in the year 1713, and finished in 1732. It is kept in repair by a tax upon butcher's meat, equal to the thirtieth part of a halfpenny on every pound.

Brigadier General Manoel de Maya was the person under whose inspection it was begun and finished.

Caoutouch, or *Indian Rubber*, is a gum which oozes by incision from a tree, (*FICUS elastica*,) indigenous to the Brazils. A ball, or bottle, of clay is suspended by a string to a branch of this tree, and washed over with the liquid gum, and thus by repeated coats the requisite thickness is acquired. It is then superficially scored in various patterns, cut down, and the clay beaten out by a wooden mallet. Balls of nearly solid gum, two to three inches diameter do not cost, in Lisbon, more than sixpence each ; and birds, beasts, human figures, and men on horseback, of the same material, may there be obtained at very reasonable prices.

CATTLE in Portugal. The Horses and Mules are small and vicious ; the best, and the only valuable ones, are brought from Spain. From seventy to one hundred and fifty moidores is no uncommon price for a good pair of Spanish Mules for a carriage.

Every farmer of £100 a year in land is compellable to keep one brood-mare, many of which are supported on the islands in the Ta-

gas, and on some low grounds near the mountains to the east of Lisbon, but about the capital only full horses are to be seen.

The Bullocks are large and beautiful; they are extremely tractable in the cart and in the plough. These are mostly bred in the northern parts of the kingdom.

CHURCH, in - - - - - Parish:
Annual Expense of.

	Moidores.
Oil for lamps, always burning	10
Lent sermons, 60 reis each house	3
By begging at the church door	1½
Interest of money lent out	2
Linen washing	2
Wax for festivals	2
Graves in the church	4
Paid to the Chapter and order of Malta	13½
Dispersations from Rome, charity for people in slavery, ditto for the Holy Sepulchre; for the mendicant Friars and other services, and two brotherhoods, &c. the exact expense of which cannot be ascertained.	
Expenses for twelve festivals	30
Gifts to the Chapter on deaths	1½
Total in moidores	71½

This church has

One Curate or parish Priest.

One Chaplain to the Altar of Souls.

One Chaplain of the Rosary.

One Chaplain at the Timber-Yard.

One Chaplain to a private Chapel.

The income of this parish Priest is esteemed great; it amounts

to 100 moidores a year. Many parish Priests in Portugal with full as much duty do not receive above a fifth of that sum. As the Bishop takes the tithes, the income of the parish Priest arises from the following articles:

	Moidores.
385 families, 1 alq. of wheat each, amounts to about	40
Annual gifts	10
Christenings	5
Certificates, bans, and marriages	2
Burial fees	12½
Twelve festivals	4½
Three vigils	½
Easter offerings	21
Presents in wood which the parish always finds	6½
Masses	6½
	100½

The Priest receives from the Bishop about 17s. English annually, and the parish gives him a sheep, worth about 4s. English.

The parish duty is very great. The Priest is sent for on all occasions, night or day, sometimes twelve or fourteen miles.

The whole income of the other Curates does not exceed 12 moidores a year each, for their public duty, masses, &c.

CORN, how threshed.

A circular place in the field, after being made level, is watered and trodden, when the sun bakes it as hard as a plaster floor. This floor is covered with the corn, and from two to nine oxen,

muzzled and yoked, are driven round it till the grain is trampled out and the straw rendered very short and soft. One man is employed to drive the oxen, and two in turning the corn.

This straw, with the addition of as much barley as their work requires, affords sustenance to all sorts of cattle. It is packed up for sale in large sheets, each quantity weighing one hundred and twenty-eight pounds, which sells from half a crown to six shillings.

CORN and MAIZE.

Four alquiers of Indian corn, weighing $92\frac{3}{4}$ lb. yielded in meal 87 lb. and 3 oz.; in bran, 3 lb. 9 oz.; waste 2 lb. It produced in bread, moderately wetted, and well baked, 137 lb. The loaves which are commonly sold of this bread for thirty reis, or two-pence English, weigh 3 lb. 6 oz. This is the usual price, but in the above calculation the bread costs $7\frac{3}{4}$ reis per pound.

One alquier of wheat weighed 24 lb. and produced $15\frac{1}{2}$ lb. of fine flour, $3\frac{1}{2}$ lb. of coarse, 2 lb. of fine bran, and 3 lb. of coarse. Total produce the same as the weight of the corn. The fine flour made $21\frac{1}{2}$ lb. of fine bread, $4\frac{2}{5}$ lb. of coarse; therefore the 19 lb. of flour produced in bread $25\frac{3}{5}$ lb. The price of wheat being 500 reis the alquier, the fine bread was 25 and the coarse 20 reis per pound.

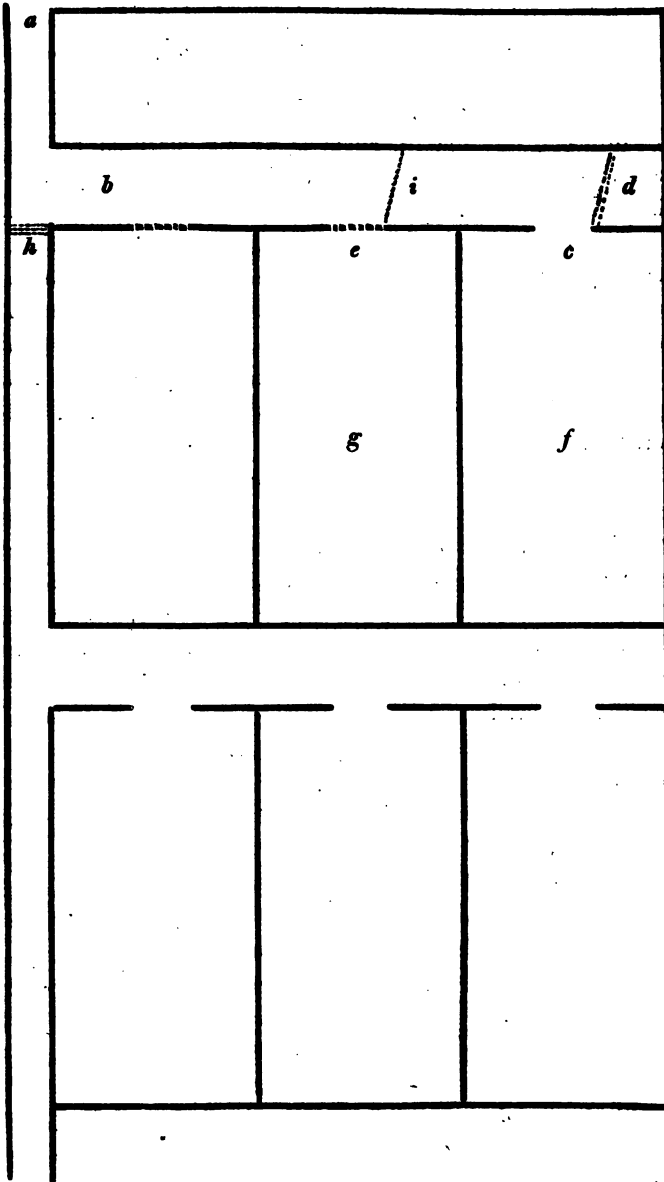
April 25th, 1793. The price of Maize was double that mentioned above, and this is usual in the spring of the year, for there are no barns, and very few granaries in the kingdom, therefore the spring and summer prices are usually double the winter or autumnal prices. The Port, and public Granary at Lisbon tend to counteract this inconvenience; but so difficult is all internal communication, owing to the badness

of the roads, that wheat is sometimes twenty-pence a bushel on the frontiers, when it is six shillings a bushel at Lisbon.

GARDENS, *how watered.*

In each garden is a well and its apparatus, called a Nora. This is worked by an ox or a cow, and the water is raised into a reservoir, called a Tankey. From this tank it is brought along a channel (*a*) which is stopped at (*b*) so as to turn the water along the channel (*b*) until it finds its way through the opening at (*c*) into the bed (*f*.) When this bed is sufficiently watered, the loose soil at (*d*) is brought forward to fill up the opening at (*c*) and the soil at (*e*) is in its turn drawn back to (*i*) to admit the water into the bed (*g*.) In this way all the other beds are watered. By this means, vegetables, though transplanted under the hottest sun, droop only for a few hours. This watering is repeated every three or four days, so as to cover the soil to the depth of some inches. The vegetables grow rapidly, and six or eight crops are taken from the land in the course of a year.

Cabbages are not set in beds, but along each side of a very narrow trench or channel.



GLASS-HOUSE, *called the Fabric.*

The buildings of this manufactory, established by an Englishman, Mr. Stevens, about ninety miles north of Lisbon, are remarkably complete, and the utmost regularity prevails in each department.

The genius of this worthy man has changed the face of the country, and the character of its inhabitants. The workmen are clean and industrious: men, women, and children appear to be excited by a laudable emulation, and a general spirit of exertion pervades the whole district. Nearly five hundred people are employed, and their habits are civil, obliging, and orderly.

When in full work three furnaces are lighted, each of which produces fifty pounds value of glass per day. Foreign glass is taxed so high, that this fabric supplies nearly the whole kingdom, except in bottle and plate glass, which are not made here.

Labour and amusement are happily combined. A theatre is erected in which plays and concerts are performed by the workmen. Mr. Stevens's house and grounds exhibit an air of comfort as well as beauty, pleasing to the English taste, and great hospitality and abundance pervade the family, but no prodigality or extravagance.

The estate consists of about fifteen thousand acres of poor, sandy soil, almost covered with heath; but good marl is found in some parts of the farm. Agriculture is badly conducted, and not without considerable loss. The usual produce of wheat, per acre, is seventy gallons; of Indian corn, planted in eighteen inch rows, eighty gallons. This is twice hoed, at four shillings per acre each hoeing. Barley and oats produce about seventy-two gallons an acre.

Mr. Stevens had the honour to entertain the Queen and Royal Family of Portugal for one day in 1786, and for three days in 1788. Her Majesty's attendants, with the vast influx

of persons from the surrounding country, formed an assembly of many thousands. Thirty-two cooks, besides their assistants, were employed, and stabling was provided for eight hundred and fifty-three horses and mules. To the credit of Portuguese honesty and sobriety, only two silver spoons were lost from sixty dozens in use; and though pipes of wine were placed in the apartments appropriated to the servants, not a man was seen intoxicated.

IMPORT of Corn to Portugal, (to Lisbon,) 1788.

Wheat	^{Moya.} 86,133
Indian Corn	7,444
Rye.....	668
Barley	19,453

Total..... 113,700

Equal to 2,718,800 Winchester bushels, one moy being 24 bushels.

IMPORTS to Lisbon from Great Britain, Ireland, and America, in the Year 1788.

By 101 vessels from Great Britain :—

	£	s.	d.
Food.....	53,324	2	6
Woollens	287,980	1	8
Metals and Minerals	31,832	0	3
Sundries	32,674	8	0
Ditto re-exported to India	32,912	0	0
Total Amount from Great Britain ..	438,722	12	5

	£	s.	d.
Brought forward	438,722	12	5
By 60 vessels from Ireland :—			
Mostly food.....	110,467	4	8
By 42 vessels from America :—			
Mostly Newfoundland cod	55,861	12	0
203 vessels, their freight	28,612	19	0
Sum total Imports	633,664	8	1
36 ships from foreign ports with cargoes.			
75 in ballast, distress, or for a market.			
10 king's ships.			
28 packets.			
352 British vessels arrived.			

*EXPORTS from Lisbon to Great Britain, Ireland,
and America, in the Year 1788.*

	£	s.	d.
By 165 vessels to Great Britain :—			
Produce of Portugal	173,823	2	5
Brazil	173,140	2	4
Islands	14,790	14	2
East Indies	51,039	17	10
Total to Great Britain	412,793	16	9
Balance in favour of			
Great Britain	£25,928	15	8
By 27 vessels to Ireland	12,069	0	3
Balance to Ireland ..	£98,398	4	5
By 11 vessels to America, mostly with salt..	2,011	7	0
Balance to America..	£53,850	5	0

	£	s.	d.
Brought forward	426,874	4	0
By 7 vessels to Africa, mostly tobacco.....	6,067	10	5
By 1 vessel to Gibraltar, with wine and groceries	300	0	0
211 vessels to British dominions with cargoes. 16 to foreign parts. 61 in ballast, or for a market, &c. 10 king's ships. 27 packets.			
325 British vessels sailed, their expense....	28,816	13	4
	£462,078	7	9
Total balance in favour of British dominions	£171,586	0	4

**IMPORTS to Lisbon from Great Britain, Ireland,
and America, in the Year 1789.**

By	£	s.	d.
81 vessels from Great Britain:—			
Food...	34,259	17	10
Woollens	226,543	6	8
Metals and Minerals	40,059	15	6
Sundries	40,808	4	0
Ditto re-exported to India	13,977	1	8
Total Amount from Great Britain to Lisbon	355,648	5	8
By 56 vessels from Ireland:—			
Mostly food	124,518	13	10
By 50 vessels from America, with cod-fish ..	57,012	14	0
187 vessels with cargoes from the British dominions, their freight	27,175	8	9

	£	s.	d.
Brought forward	564,355	2	3
56 with cargoes from foreign parts.			
45 in ballast, distress, or for a market.			
4 king's ships.			
27 packets.			
319 British vessels arrived.			
Sum total of Imports	564,355	2	3

**EXPORTS from Lisbon to Great Britain, Ireland,
and America, in the Year 1789.**

By		£	s.	d.
134 vessels to Great Britain:				
	Produce of Portugal	123,313	19	3
	Brazil	273,066	5	10
	Total to Great Britain.....	396,380	5	1
By 27 vessels to Ireland		20,539	6	5
	Balance to Ireland .. £103,979	7	5	
By 7 to America, with salt		735	9	9
	Balance to America .. £56,277	4	3	
By 8 to Africa, tobacco		5,856	4	0
By 1 to Gibraltar		300	0	0
177 vessels with cargoes to British dominions.				
42	to foreign parts.			
97	in ballast, or for a market, &c.			
5 king's ships.				
28 packets.				
349 British vessels sailed, their expenses..		31,061	0	0
Total exports		454,872	5	3

	£	s.	d.
Brought forward,—Total exports ..	454,872	5	3
Total balance in favour of British dominions	109,482	17	0
	<u>£564,355</u>	<u>2</u>	<u>3</u>

**IMPORTS to Lisbon from Great Britain, Ireland,
and America, in the Year 1790.**

By		£	s.	d.
65 vessels from Great Britain :—				
	Food.....	5,699	4	0
	Woollens	264,285	7	4
	Metals and Minerals.....	40,488	13	0
	Sundries	48,259	14	0
	Amount.....	<u>358,732</u>	<u>18</u>	<u>4</u>
	Balance against Great Britain.....	£159,886	1	1
By 45 vessels from Ireland		141,479	10	2
By 50 vessels from America (cod-fish).....		55,329	9	0
160 vessels from British dominions, with cargoes, their freights		22,368	2	1
49 from foreign parts, with cargoes.				
106 in ballast, for a market, &c.				
14 king's ships.				
31 packets.				
360 British ships arrived.		577,909	19	7
Balance in favour of the Port of Lisbon ..		<u>1,286</u>	<u>17</u>	<u>5</u>
		<u>579,196</u>	<u>17</u>	<u>0</u>

N.B. Part of the Imports in 1788, came by 2 foreign vessels.
 in 1789, came by 2 ditto.
 in 1790, came by 8 ditto.

**EXPORTS from Lisbon to Great Britain, Ireland,
 and America, in the Year 1790.**

By 163 vessels to Great Britain:—	£	s.	d.
Produce of Portugal	155,045	13	5
Brazil	357,930	15	8
Islands	4	9	4
India.....	5,638	1	0
Total to Great Britain.....	518,618	19	5
By 181 vessels to Ireland	20,383	11	6
Balance to Ireland .. £121,095	18	8	
By 20 vessels to America	1,883	4	2
Balance to America .. £ 53,446	3	10	
By 8 vessels to Africa	5,168	7	7
209 vessels to Great Britain with cargoes.			
28 to foreign parts.			
90 in ballast, or for a market, &c.			
14 king's ships.			
30 packets.			
371 British vessels sailed, their expenses..	33,142	13	4
	579,196	17	0

N.B. Part of the exports in 1789 by 2 foreign ships.
 in 1790 by 1 ditto.

**IMPORTS of *British Goods to Lisbon in the Year*
1791.**

FOOD.

			s.	£	s.	d.
Wheat	1825 quarters	at	40	3,650	0	0
Potatoes	267 cwt.	at	2	26	14	0
Cheese	1048 cwt.	at	43	2,253	4	0
Butter	305 cwt.	at	60	915	0	0
Herrings	100 barrels	at	21	105	0	0
Porter	184 butts	at	100	920	0	0
Ditto.....	7 hhd.	at	50	17	10	0
Cyder	2 casks	at	40	4	0	0
Fodder	30 pipes	at	30	67	10	0
Hay	60 bundles	at	1	3	0	0
Mustard	1 box	at	40	2	0	0

WOOLLENS.

Under the names of long Bags, Colchester
Bags, Cloths, Cassimeres, Coatings, Flannels,
Blankets, Stuffs, Worsted Breeches,
and one Carpet, to the amount of 248,140 6 0

METALS.

Viz. Copper 2599 at 86s. Tin at 84s. Lead at
22s. Steel at 36s. per cwt.; also shots, li-
tharge, &c. 30,177 19 0

			s.	d.
Iron-hoops ..	2088 cwt.	at	16	0
Cast-iron	2659 cwt.	at	23	0
Nails.....	123 cwt.	at	20	0
Alum.....	189 cwt.	at	18	0
Copperas	1236 cwt.	at	5	6
Tinned plates	1193 boxes	at	50	0
Pins	12 cases	at	100	0
Coals	5145 tons	at	12	0

Amount 42,860 14 0

SUNDRIES.

£ s. d.

Viz. Silk Stockings and Breeches, Sailcloth, Linens, Cordage, Flax, Pitch, Tar, Staves, Bottles; 2769 gross, at 18s. Vitriol, Aqua- fortis, Tortoise-shell, Hardware, £8160; Cutlery, £1360; Haberdashery, Stationery, Glass ware, £840; Drugs, Earthenware, £855; Trees, Hides, Skins, 9 Piano-fortes, 1 Harpsichord, 5 Coaches, 2 Chariots, 2 Chaises, 3 Carts, 14 Clocks, Coach-springs, Saddlery, Cabinet-ware, Mathematical In- struments, £260. Amount	37,395 6 0
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From Ireland.

Wheat	21,063 quarters, at	40s.
Barley	311 ditto at	27
Malt	3 ditto at	36
Potatoes	1481 cwt. at	2
Butter	40,684 cwt. at	60
Lard	620 cwt. at	40
Beef	1,873 barrels, at	28
Pork	250 ditto at	50
Linen	4972 pieces, at	60
Biscuits, Tongues, Ox-guts, Mustard, Wire, Plate, Cam- lets, ...	1044 pieces, at	140
Amount	171,819 4 0	

From America. (British.)

Newfoundland cod ..	74,419 quintals, at	12s.
Salmon	18 tierce, at	50
Canada cod	9,340 quintals, at	12
Wheat	2,866 quarters, at	86

	£	s.	d.
Maize 16 quarters, at 25s.			
Pipe-staves, 240, value £2.			
Amount.....	55,340	8	0

**EXPORTS to Great Britain from Lisbon, in the
Year 1791.**

PRODUCE OF PORTUGAL.

			Milreas.
Carcavella Wine.	520 pipes,	at	68,000
Lisbon Wine ..	2,407 pipes,	at	56,000
Olive Oil	25 pipes,	at	100,000
Brandy.....	40 pipes,	at	153,600
Lemon-juice....	7½ pipes,	at	76,800
Oranges	20,768 chests,	at	6,000
Lemons	10,384 chests,	at	5,900
Salt	3,546 moys,	at	1,850
Onions, Grapes, Sweetmeats, Figs, Skins, Mats, Cork, Chestnuts, Walnuts, Almonds, Olives, A- corns, Rags, Feathers, Ox Horns.			
Wool.....	40 arroves,	at	8,000
The amount at the average exchange of 68½d.			
per Milrea			138,467 5 3

PRODUCE OF BRAZIL.

			Milreas.
Cotton	7,206,256 pounds,	at	0,291
Indigo	61,376 ditto,	at	1,000
Tobacco.....	136 rolls,	at	30,000

	£	s.	d.
Also, Campeche Wood, Pernambuco			
Wood, Ipecacuanha, Anotta, Sarsaparilla, Tapioca, Balsam of Capivi, 11 barrels, ...	at	14,400	
Cochineal, Ginger, Borachos, Con-trayerva, Sugar, 40 arroves, ...	at	5,800	
Planks, Hides, to the amount of	644,012	2	5

FROM THE ISLANDS.

Orchille, .. 137 quintals, at 7,200, equal to	282	11	3
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EXPORTS from Lisbon to Ireland.

			Milreas.
Carcao Wine ..	20 pipes,	at	68,000
Lisbon Wine ..	185½ pipes,	at	56,000
Oranges	242½ chests,	at	6,000
Lemons	270 ditto,	at	5,900
Cotton Wool ..	468,965 pounds,	at	270
Salt	1,155 moys,	at	1,850
Tobacco	5 rolls,	at	30,000
Besides Tapioca, Cocoa Nuts, Sugar, Pernambuco Wood, Onions, Figs, Mats, Skins, Sarsaparilla, Ipecacuanha, Jar Raisins, Olives, to the amount of			19,652 19 2

To America.

Salt	4,047 moys,	at	1,850
Oranges	25 chests,	at	6,000
Amount			2,187 13 4

To Africa.

Tobacco ..	2470 small rolls,	at	7,425
Sugar	23 arroves,	at	2,100
India Goods			1,086,000

To Gibraltar.

Tea, Wine, Sugar, &c.	Milreas. 3,000,000
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*Total EXPORTS and IMPORTS from Lisbon to the
British Dominions Anno 1791.*

	£	s.	d.
To Great Britain.....	782,761	18	11
To Ireland	19,652	19	2
To British America	2,187	13	4
To Africa	5,578	10	1
To Gibraltar	859	7	6
Expenses of 330 ships at Lisbon	30,250	0	0
	Exports	841,290	9 0
	£	s.	d.
From Great Britain	358,574	5	0
From Ireland.....	171,819	4	0
From America	55,340	8	0
	585,733	7	0
Balance in favour of Lisbon	255,557	2	0

**IMPORTS to Oporto from the British Dominions in
the Year 1792.**

	£	s.	d.
Woollens	21,600	0	0
Metals and Minerals	1,400	0	0
Fish from Newfoundland, butter and corn from Ireland	600	0	0
Sundries	400	0	0
Balance in favour of Oporto	870,089	0	0
	<u>1,200,089</u>	<u>0</u>	<u>0</u>

**EXPORTS from Oporto to the British Dominions
in the Year 1792.**

	£	s.	d.
Wine 54,258 pipes at £21	1,139,418	0	0
Oil 9 pipes at £29 : 4 : 0	262	16	0
Cotton 19,360 arroves	56,531	4	0
Cork 13,000 quintals	9,885	8	4
Fruit and food	4,866	13	4
Sundries	4,000	0	0
Insurance made in Oporto at £2 per cent. ..	1,000	0	0
Expenses on 270 Vessels at £40 each in- cluding port-charges and pilots ..	10,800	0	0
	<u>1,226,764</u>	<u>1</u>	<u>8</u>

IMPORTS, the average annual amount of ar- ticles from the British dominions for the last 5 years does not exceed ..	356,674	18	9
Balance in favour of Oporto and its district.	<u>870,089</u>	<u>3</u>	<u>11</u>

LABOUR, *the Price of.*

At Mr. Stevens's fabric, about 90 miles north of Lisbon, the wages of a common labourer per day are 120 reis, equal to $8\frac{1}{2}d.$ English: during the time of hoeing the Indian corn, which lasts about two months, 160 reis or $9\frac{3}{4}d.$

A labourer in Portugal from the number of holydays, does not, on an average, work more than five days a week, which, at $9\frac{3}{4}d$ *per diem* for a week of five days, during two months, is 1 12 6
for forty-five weeks of five days each at $8\frac{1}{2}d.$ 8 3 6 $\frac{1}{2}$

Annual earnings £9 16 0 $\frac{1}{2}$

The following being the kind and quantity of provisions which a labourer takes with him for one week's support: viz.

	Reis
$\frac{3}{4}$ of an alquier of Indian corn, at 120 reis the alquier....	80
$\frac{1}{4}$ of an alquier of dried kidney-beans.....	50
A pint of oil	50
Salted fish	60
	240

amounting to 1s. 4d. a week, or per annum £3 : 9 : 0.

Consequently a labourer working only five days in a week earns in the year £6 : 7 : 0 $\frac{1}{2}$ more than he expends in his sustenance. His general drink is water; and he says Indian corn supports his strength better, and is more nutritious than wheat.

Mr. S's head-gardener costs him (without being boarded and without receiving any perquisites,) £1 : 16 : 0 per month.

A day-labourer pays annually to the church,

	Reis
1 alquier of wheat	500
$\frac{1}{2}$ alquier more for a cake	120

$\frac{1}{2}$ alquier more for Easter offering	Reis 250
$\frac{1}{2}$ alquier Indian corn for the lamp	120
For Lent sermons	60
For Bulls from Rome	60
	1,110

equal to 6s. 1d. English : besides festivals, free-gifts, burials, and Christenings.

A cart, two oxen, and a man, may be hired for a day of 10 hours, for 250 reis, or 1s. 8d. English money.

N. B. A Winchester bushel measures two and one-half alquiers.

LANDED ESTATES

In Portugal are not alienable, but descend to the eldest son ; neither can the possessor charge them with payments in favour of his younger children. He cannot lease them for more than three years, though the lease may be made renewable three years more, and for a third term of three years under some restrictions, and a dispensation from the proper officer.

Such property as a man attains himself he may dispose of as he pleases.

He has also a right to all that his children earn whilst under 21 years of age ; but that age attained, the eldest son may claim possession of a certain portion of the landed estate. Hence it is evident that the daughters and younger sons can have little or no fortune. A princess of the blood-royal has only 5000 moidores for her marriage-portion.

King Joseph published an edict cutting off the entails of

all estates of less value than £56 a year. Such lands soon found their way to market, and are much better cultivated than the other estates. But after this edict had been a few years in force, it was repealed by the Queen, at the instigation of the clergy, who found they had fewer legacies left to the church by the new than by the old possessors of the lands.

LISBON *Market*

For flesh is served by contract, and none but the contractor authorized by the crown can sell meat in Lisbon. Every pound of meat sold pays a tax of 3 reis (about $\frac{1}{3}$ of a penny) to support the aqueduct, &c.

Water is carried to different houses by about 2000 men, some of whom are convicts, some negroes, but mostly Galicians.

FISH pays a tax of 30 per cent. taken in kind, for the use of the court and the religious houses, and the best fish being thus selected, the tax amounts sometimes to near 70 per cent.

The fish thus taken often meets the laborious fisherman in the market and lessens his sale.

Salted fish is exempt from this tax.

MONEY, *the Interest of,*

In Portugal is limited to 5 per cent. but, in order to render the security legal, it must be registered; when the government takes a tax of 10 per cent. on the interest paid.

NOBILITY.

The titles of the Nobility in Portugal are not strictly hereditary; but, on the death of the possessor, the next heir must wait for the title until it is again conferred by the crown, which is done by the King calling him by the titular name.

Portugal, under the feudal system, never had any villains or slaves attached to the land; hence all the people consider themselves as *noble*, which may account for their often refusing to carry burdens, or to perform many menial offices, now done by negroes or Galicians. To this cause also may be assigned the superior deportment of the common people, and the great attention paid to them by the higher ranks of society.

The Portuguese nobles are obliged to live at Lisbon, or wherever the Court may be; and for this attendance they have a claim upon the crown of a measure of barley, or, in lieu of that, 10 reis per day.

They are not permitted to absent themselves without special leave, not even to reside in the country upon their own estates, which are usually the places of banishment for offensive conduct.

OIL.

The monopoly of the train-oil trade yields annually to the Portuguese government about sixteen thousand pounds.

OLIVE OIL.

The olives when ripe are shaken and beaten off the trees. This business is concluded about the end of November. They are then laid in heaps, and some salt is thrown over them. As they ferment and soften the watery juice that flows from them is permitted to escape. They are then ground in a mill, like that used in cyder countries, except that the sides are shaped like an inverted and hollow cone, the truncated apex only being flat, the stone which traverses on its edge round and round the axis of this cone bruising the fruit.

The ground fruit is then put into bags; these bags one upon another into a press, and pressed by the weight of a loaded lever. As the oil and the aqueous juice escapes, it runs into deep earthen pots, which are placed in a range, and a slow fire is kept burning under them.

From these pots the oil is drawn as soon as the watery particles have had time to separate from it.

After the first pressure, the olives are ground again; heated in a large cauldron, and then subjected to a stronger pressure than before. During the time of the pressure the bags are frequently sprinkled with hot water, to promote the flow of the oil.

The oil obtained by the first and second process is mixed together.

The workmen say, that the addition of salt makes the oil burn better, but the Abbé Corrêa da Serra observes, that the olives yield a full crop only once in three years; a middling crop and a short crop the two intermediate years; and that the salt is only useful to preserve the fruit until they have time to grind it.

Does it not also help to break down the texture, and to promote the separation of the purple watery liquor from the oil?

A little of the oil-cake is given to hogs, but it is chiefly used

for fuel. The oil fresh from the mill sells at two or three shillings a gallon.

The important application of olive oil as a cure for the Plague cannot be too extensively circulated, and is inserted beneath as published by the Royal Academy of Sciences, at Lisbon.*

* The following short directions for the cure and prevention of the Plague, are compiled from a small pamphlet in the Italian language, lately published by Count Berchtold, at Vienna, 1797; one copy of which is in the possession of the Royal Academy of Sciences of Lisbon, to whom it was presented by His Excellency Mr. Pinto, Her Majesty's Secretary of State, &c.

The Academy has ordered translations to be made into Arabic, French, and Portuguese; and this extract in English is particularly intended for the use of the numerous bodies of British subjects at present employed in their country's service in this part of Europe; as the garrison of Gibraltar; the fleet at sea; the troops on shore in Portugal; and the masters of British vessels in its harbours.

Count Berchtold says, that the method was first proposed by George Baldwin, Esq. His Britannic Majesty's Agent and Consul-General at Alexandria, in Egypt; who, during a long residence in that country, after much thought and observation was induced to believe, that the use of sweet olive oil, applied to the skin, might prove beneficial in the treatment of this dreadful and hitherto incurable malady.

Mr. Baldwin communicated his ideas to the Reverend Lewis de Pavia, Chaplain and Agent to the Hospital (called St. Anthony's) at Smyrna; who, after five years' experience, pronounces it to be the most efficacious remedy hitherto made use of, for the space of twenty-seven years that the Hospital had been under his management. He acquainted Count Berchtold with the success, and the mode of application; and from his communications, the pamphlet seems principally to have been composed.

Count Berchtold further says, that it is Mr. Baldwin's intention to publish a more full and philosophical relation of his observations and experiments; that he favoured the Count with the perusal of the manuscript, and permitted

OLIVE TREES.

The wild olive bears a small and not a pulpy fruit, and its branches end in thorns; but when grafted, the thorns disap-

him to transcribe any part of it; and he apologizes to the world and to Mr. Baldwin for this seeming anticipation of the work, at the same time observing, that he feels it an indispensable, a sacred duty, to lose no time in making known a discovery of such importance; particularly to those countries that are nearer, and have more frequent commerce with the Barbary States, and the ports of the Turkish Empire.

The directions are simply these. Immediately that a person is perceived to be infected with the plague, he must be taken into a close room, and over a brazier of hot coals, with a clean sponge dipped in warm olive oil, his body must be very briskly rubbed all over, for the purpose of producing a profuse sweat: during the friction, sugar, and juniper berries must be burnt in the fire, which raise a dense and hot smoke, that contributes to the effect.

The friction ought not to continue more than four minutes, and a pint of oil is enough to be used at each time.

In general the first rubbing is followed by a very copious perspiration, but, should it fail of this effect, the operation may be repeated; first wiping the body with a warm dry cloth; and in order still further to promote perspiration, the patient may take any warm sudorific drink, such as elder-flower tea, &c.

It is not necessary to touch the eyes; and other tender parts of the body may be rubbed more gently.

Every possible precaution must be made use of to prevent the patient taking cold; such as keeping covered those parts of the body not directly under the operation, nor must the linen be changed till the perspiration has entirely subsided.

The operation should be repeated once a day, until evident symptoms of recovery begin to appear.

If there are already tumours upon the body, they should be gently and more frequently rubbed, till they appear to be in a state of suppuration; when they may be dressed with the usual plasters.

The operation ought to be begun on the appearance of the first symptoms of the disease; if neglected till the nerves and the mass of the blood are affected, or a diarrhoea has commenced, little hopes can be entertained of cure; but still, the patient should not be despaired of, as by an assiduous application of the

pear, and the fruit becomes larger and more pulpy. It is customary to split the trunk of the trees whilst young, and to drive wedges to keep the clefts open.

OPERA HOUSE, *in Lisbon.*

The present structure was commenced in December, 1792, and completed in the surprisingly short space of six months.

It is of an oval form, the portion allotted to the audience appearing to be about two-thirds. A royal box, lined with pink satin, adorned within by mirrors and lustres, without by various devices in richly burnished gold, adds a grand effect to the centre of the theatre. Over this is a gallery appropriated to the attendants. On each side twelve other boxes extend to the stage, having three tiers above the line of the royal box, and one beneath. The two principal ranges are lined with blue velvet;

means proposed, some few have been recovered even after the diarrhoea had commenced.

During the first four or five days, the patient must observe a very abstemious diet the author allows only a small quantity of Vermicelli simply boiled in water. Nor must any thing be taken for the space of thirty or forty days except very light food; as he says an indigestion in any stage of the disorder might be extremely dangerous. He does not allow the use of wine till the expiration of forty days.

There is no instance of the person rubbing a patient, having taken the infection: he should previously anoint himself all over with oil, and must avoid receiving the breath of the infected person into his own mouth or nostrils. The prevention to be used in all circumstances, is, that of carefully anointing the body, and living upon light and easily digestible food.

One of the many ingenious observations made by Mr. Baldwin is, that amongst upwards of a million of inhabitants carried off by the plague in Upper and Lower Egypt, during the space of four years, he could not discover a single oilman or dealer in oil.

the others, with red morocco leather, and varying in price according to situation. The different circles are handsomely decorated externally with appropriate paintings. The pit is not frequented by ladies. The orchestra contains twenty-four good performers. The dancers are superior, and the singing much admired. The operas are Italian, and performed by an Italian company, but the present Queen will not allow females to appear on the stage. A spacious stone gallery communicates with each tier of boxes. Ices and other refreshments are supplied in the house. The stage is of great compass, and the scenery admirable. The opera is a fashionable resort, where visits are constantly paid and received, without much attention to the performance.

The old, or *King's Opera House*, was destroyed by the earthquake of 1755. It was a more extensive establishment than the present one, and the spacious stage was contrived to exhibit troops of cavalry on a pavement in the rear; and was so near to the Tagus, that on particular occasions the river and shipping were made to appear. The expense of each performance amounted to several thousand pounds, which was defrayed by his Majesty.

ORANGES AND LEMONS.

Are not indigenous, but were originally imported from Africa. The climate of Portugal is rather too cold for them; they suffer much in the severer winters, and only do well, at any time, in the lower grounds and more sheltered situations. The tops of the trees are often injured by the cold winds in common winters, especially when they grow at all lofty.

Oranges do best when planted rather wide asunder. Lemons are better for being crowded together. The citron is the best

stock on which to graft both the lemon and the orange. The plants of both raised from seed, and never grafted, produce the best crops, both in quantity and quality; but these trees, especially when old, become so thorny, that it is troublesome to gather the fruit.

POPULATION OF PORTUGAL.

Lisbon alone contains 194,000. It consists of 42 parishes.

The increase of population amongst Mr. Stevens's manufacturers, at his glass-works, is in the proportion of four births for one burial.

In the neighbourhood of the glass-work, but unconnected with it, the population is in high grounds from 27 to 32 born annually for every 1000 inhabitants. In low grounds, from 38 to 42 for every 1000; and near the sea, where fresh fish is plentiful, the annual increase is from 48 to 52 born for every 1000 inhabitants.

Nuns 8,000	} in Portugal.
Friars 15,000	

By the most accurate returns, the total population of Portugal amounts to 2,400,000; which number equally distributed over 27,376 square miles of land, gives between 87 and 88 persons to each square mile.

REVENUE OF PORTUGAL.

The revenue from the Brazils is nearly £2,020,500, that from taxes is about £506,250, which is mostly expended in the payment of collectors and sinecure places.

Besides the above, the produce of the diamond mines in the Brazils must be reckoned ; so that the total revenue of the kingdom is but little short of four millions sterling.

The national debt is between three and four millions sterling, but only about one-half of this sum bears interest.

The revenue of the clergy is two millions sterling a year.

The whole product of the Brazil trade is paid into the hands of government in little more than two years ; for the duties paid on the imports and exports are rated thus :—

On all goods imported from the Brazils 27 per cent.

On all goods exported to the Brazils, 6 per cent. in Portugal, and 12 per cent. on arriving there.

27

6

12

—

45 in one year, or

90 per cent. in two years.

STABLES, (*Royal.*)

The maintenance of those in the vicinity of the metropolis, exceeds the sum expended in supporting the thirteen regiments of cavalry, (three hundred and thirty men in each regiment,) the expenses of each regiment being £9,500 English per annum.

CARRIAGES, standing for hire in Lisbon, amount to sixteen hundreds.

WATER-WORKS and FOUNTAINS; of these the yearly expense is 35,000 moidores.

CORN MARKET, costs annually 21,000 moidores.

STREETS cleaning, which is very rarely done, and **lighting**, for which only seven hundred lamps are employed, 15,000 moidores annually; but it seems that some of this money is consumed for other public purposes.

TAXES.

The Lord of the soil, from most of the land west of Lisbon, receives one-fourth; government, and the clergy, each one-tenth, of the whole produce.

Grass, lucern, hay, and green corn cut for cattle, are exempt from tithe, as also all meat and wine, the produce of the farm, consumed in the family.

The lord's fourth is not taken from the whole produce, but from the remainder, after the other taxes have been paid.

Government levies a tax of 10 per cent. on every thing that is sold in Portugal, whether land, houses, furniture, horses, or any other article for use or convenience.

Oranges pay 10 per cent. on the first purchase, and as much more when sold by the merchant; besides two other duties of $4\frac{1}{2}$ per cent. making in all 29 per cent. before they can be exported.

IMPORTS of every kind, except provisions, pay a duty of 27 per cent.

HOUSES pay 10 per cent. on the rent.

WINE.—Every pipe sold to the vintner pays $2\frac{1}{2}$ moidores; and every pipe exported, half a moidore.

On an average of the last ten years, the produce of all the

duties from the CUSTOM-HOUSE, in Lisbon, which goes to the crown, has been annually 850 millions of reis.*

There is also a half per cent. tax on every thing exported, in addition to the other duties, being a sort of commutation, in lieu of a tax of 10 per cent. on all merchant's stock.

TOBACCO.

All the tobacco used in Portugal comes from the Brazils, and is delivered at Lisbon, at a price fixed by the government, which receives £280,000 annually of the contractors for the monopoly of the trade. It is exported to China and to Africa; to the latter place it is carried by the English engaged in the slave-trade.

VINEYARDS.

It is ten years after a new one is planted before the wine attains its best qualities. The vines continue to bear well for twenty years; but there is no regular and general renewal of them, for as they become weak, or die, they are rooted up, and fresh ones are planted in their place. The stems are allowed to rise only about three feet from the root, and all the shoots are cut away in the winter, leaving only one, or, at most, two to each root. The vines are propagated by layers, laying all the shoots from a single stem, deep in the earth in the winter

* A rei is about the fifteenth part of a penny.

season. The bearing shoot which is left on the stem, as mentioned above, is bent, and its extremity tied down to the main stem. One acre of land yields from four to five pipes of wine.

WATER AT LISBON.

The further tepid spring from the Great Square, (Praça de Commercio,) or that most easterly from the square, is used by many families, and is more esteemed than the water brought by the aqueduct. As it discharges itself from the pipes, its temperature is 73° of Fahrenheit's thermometer.

According to Vandelli, two quarts of this water yield—

of Magnesia	gr. 1
Selenite	3
Mar. salt with a min. alk. basis	2
Ditto, with an earthy base	1
	7

and a certain portion of gas.

TYTTES.

The whole parish, in which Mr. S—— resides, pays to the church and to the clergy 800 moidores a year. Before he established his manufactory, and cultivated his farms, the

tythes did not amount to 80 moidores a year, and the parish did not pay more than 100 moidores to the church and clergy.

The bishop reserves the tenth of the wine, corn, and oil, after they are prepared for market, as a compensation for the great and small tythes which he could take in kind.

The tythes thus paid to the bishop amount to about 400 moidores a year.

WHEAT.

That grown in Portugal, Italy, and other southern climates of Europe, is called *hard* corn. That from America, England, and the north, is called *soft* corn.

The *hard* corn makes heavy bread ; the grain is smaller and much harder than that from the north.

The *soft* corn will not make vermicelli.

A mixture of the two sorts makes the best bread.

WINE. (1793.)

In the vicinity of Lisbon, the average price of wine, from the grower to the merchant, is about £4 per pipe.

From fifteen to twenty-two gallons of brandy are put into each pipe of *Carcavellas*, or best *Lisbon wine*, prepared for exportation.

The city of Lisbon consumes annually 50 or 60,000 pipes

of wine, which is four times the quantity consumed twenty years ago.

Oporto wines are contraband at Lisbon, but each family may keep one quarter of a pipe, on making affidavit that it is for private use.

Oporto wines, for exportation, have as much brandy put into them as those of Lisbon; and, indeed, much of what we call *Port*, has lately been made in the neighbourhood of Lisbon.

The vintage begins on the first Monday after Michaelmas-day, whether the season be earlier or later, and the grapes, whether unripe, perfectly ripe, or dead ripe, are all collected together, without any separation or selection; which circumstance alone is sufficient to account for so large a quantity of brandy being necessary to prevent the wine from spoiling.

The grapes thus collected are put into a large cistern, and trodden by men. The juice being received into a smaller cistern. Nine gallons of this juice are put into pipe casks. The air in each cask is then exhausted, or rather blown out by a kind of bellows, in order the better to enable several large brimstone matches to burn in the cask. The cask is then agitated backwards and forwards, being placed for that purpose across a ridge of earth, and thus the vapour, formed by the burning brimstone, is absorbed into the liquor.

The liquor thus prepared is put into other smaller casks; isinglass is dissolved in it, and it is then called *stum*.

When the juice ceases to run from the first treading, the skins, stalks, &c. are collected in the centre, under a large beam, with a cross-bar at one end, which is let into two loops, and with a large screw at the other end, by which it is raised or lowered as the *cheese* requires more or less pressure; for so the stalks, &c. when neatly raised in a round form, and bound with a cord to keep it in place, are called. When no more juice is obtainable from this operation, the cheese is broken down, again trod, reared again, and pressed as before.

All the juice, except what was taken for the stum, is carried immediately from the cistern, without any selection or separation, to the vaults, (what is bought by the merchant is purchased in this state,) where to each pipe of it is added a portion of the stum, and also of brandy.

The wine is racked in November, and once in each of the three or four succeeding months; afterwards once in three or four months as occasion may require. After this particular attention is paid to the state of the wine at the different periods of the budding and blossoming of the vines; at which seasons it is said to be subject to ferment more or less until four years old. At each racking more brandy is added, till it amounts in quantity to fifteen gallons to each pipe of Carcavellas.

The brandy is distilled from the sediments left at the different rackings, and from such of the pipes of wine as are least approved for keeping.

The husks of the grapes when dried are reserved for the hogs, the seeds for the pigeons, and the stalks are excellent for lighting fires, or heating ovens.

Red Lisbon.—The *black* grapes are trodden by men, and the juice is drawn off as from the white; but it is then put into large tubs, and after the grapes have been pressed once, the skins, stalks, &c. are put into the tubs to the juice, where they undergo a fermentation. On the third day a considerable degree of heat is generated, which increases on the fourth, continues nearly the same on the fifth, and on the sixth begins to decrease. The liquor is then drawn off, the stalks and skins again trod in the tubs, and then returned to the cistern and pressed a second time.

In this state it is sold, or if kept for home consumption, tunned. I soon becomes fine, but is not allowed to be drawn for sale before the 11th of November, when inspectors visit the different public-houses to taste the wine, and to give permission to tap.

The fermenting vat, from the third to the sixth day, is frequently used as a *warm bath*, and is much praised for its efficacy in rheumatisms, contractions, and gouty rigidities; and likewise for general or partial relaxations or weaknesses.

The price of the new wine, to the merchant, is from

£	s.	d.	£	s.	d.
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3 : 7 : 6 to 6 : 15 : 0 per pipe.

Letter from Dr. WITHERING to Dr. BEDDOES,
ON CONSUMPTION OF THE LUNGS.

September 1, 1793.

“ DEAR SIR,

“ The task you have allotted to yourself is an important one; the philanthropist cannot but be interested in its success; the physician must rejoice at the probability of learning how to cure a frequent, a cruel, and hitherto incurable disease; philosophers will urge you to proceed, from a conviction that should you fail in your higher aims, you cannot but extend the boundaries of science, and throw new light on the laws of the living machine; and should your endeavours ultimately be crowned with success, and the most amiable, not to say the most beautiful individuals of our species, be thus snatched from a premature fate, numerous private families will be indebted to you for their greatest comforts, and society at large for its brightest ornaments.

“ It is from such considerations as these, as well as at your particular desire, that I now am about to communicate to you such observations as have occurred to me during many years' attention to the *Phthisis pulmonalis*; but I must confine myself to those circumstances which more

immediately tend to support or to invalidate your opinions, otherwise I should write a volume instead of a letter.

Catarrhs Causes of Consumptions.

“ Young people themselves as well as those who have the direction of them, should have it strongly enforced upon their minds, that a cough merely the consequence of a cold, ceases of itself in eight or ten days ; that if it continue beyond that period, there is danger that a consumption may be the consequence. Bleeding, spare diet, and the other usual modes of obviating inflammation, should be immediately pursued until the cough shall entirely cease ; and particularly bleeding by leeches or cupping, on the part where any pain shall be felt in the chest.

Causes of Catarrhs.

“ A sudden change from cold external air to that in a heated room is certainly a much more frequent cause of inflammatory affections of the lungs, &c. than has been generally supposed ; it is, I believe, the most general cause, but surely it is not the only cause of taking cold ? I am persuaded that a sudden transition from a warm to a cold apartment, or to a stream of cold air will produce the same effect. We take colds in summer when no fires are lighted in our sitting rooms, though not so frequently as in winter. Horses and cows

get colds, though they never experience much sudden change from cold to heat in the temperature of the air they breathe; whilst the dog, who from the temperature of the coldest seasons instantly on entering the house lies down close to the hottest fires, and *vice versa*, seems little, if at all, liable to catarrhal affections. Horses sometimes die consumptive; cows often; dogs, I believe, never.

Kinds of Consumption.

“ The different kinds of consumptions should be better distinguished than they have been, not only as influencing the prognosis, but as directing to a more successful practice. I agree with you that patients have reaped no advantage from the prevalent idea that most consumptions have a scrophulous origin. One species you have happily named, the florid, and it is readily distinguished. There exists also a truly scrophulous consumption, but it is a rare and not an incurable disease if the treatment be properly adjusted to its nature; but the treatment which I have repeatedly found successful here would only hasten the florid consumption to its fatal termination. When the scrophulous consumption cannot be traced by any known family disease, or by the more obvious symptoms in the constitution of the patient, it may sometimes be ascertained by knotted cords of lymphatics running down the

neck and dipping under the clavicle into the chest.

Substance of the Lungs destroyed.

“The existence of this fact is not disputed, but it must be a very rare occurrence. Would not the falling in of the ribs in the case you mentioned be equally explicable on the supposition of a caries induced in their bony substance from a disease in the pleura? Or might not the increasing debility, &c. of the patient be alone sufficient to produce such an appearance, which often occurs in ricketty children? At one period of my life I had opportunities of accurately examining the lungs of many who died consumptive, but I never met with any thing like the destruction of them. It was once my intention to have given these observations to the public, but the utility of that design was fully answered by the publication of the works of the late Dr. Stark, because nothing that I had observed had escaped the attentive researches of that ingenious and indefatigable man, by whose early death science was deprived of one of its most active votaries.

Who exempt from Consumption.

“It is a prevalent opinion that the workmen employed about lime-kilns never become con-

sumptive; and it is usual for the affected with the disease to repair to the ignited kilns to breathe the vapour issuing therefrom. This rude mode of administering atmospheric air deprived of part of its oxygen and combined with a portion of carbonic acid, has not under my observation ever cured a patient; but still I am disposed to believe that opinions generally prevalent have some sort of foundation.

“ In looking about for the causes which promote or retard the frequency of consumptions, different situations and occupations became of course objects of my attention; and the only classes of men I have yet observed exempt from the disease, are butchers and makers of catgut. They both pass much of their time amidst the stench of dead animal matter, the latter very much so; the former live chiefly on animal food, and are much exposed to the inclemencies of the seasons,* whilst the latter live as other manufacturers do, and work under cover in close and rather warm buildings. These people are always sleek, often fat, and the rosy bloom of health adorns their cheeks. These facts but ill accord with our theoretical notions of putrid diseases.

* And accustomed to ride on horseback; an exercise which, though unhappily not so decidedly curative as in the days of Sydenham, has certainly proved beneficial in many cases. EDITOR.

Progress of Consumption stopped.

“ The effect of pregnancy in arresting the progress of consumption has long been known, but it was reserved for you, Sir, to turn this remarkable fact to advantage. Should your idea concerning the effect of the impeded action of the diaphragm be maintained, the application of a compressive bandage upon the abdomen cannot fail to present itself to your imagination.

“ But the progress of consumption is also stopped by insanity. This is a circumstance well worthy your attention. A young woman in the last stage of phthisis suddenly became furiously insane. After three months the insanity ceased, the phthisical symptoms returned, and she died in a few weeks.

“ A young gentleman, whose father died consumptive, consulted me about a troublesome cough, pains in his chest, hectic fever, and emaciation. I had no expectation of his living, but wished him to winter in a warmer climate. On his return the following spring the phthisical symptoms had no existence, but there was an unusual oddity in his manner, which very shortly showed itself in a confirmed insanity. For several weeks he was furious, but that state gradually gave way to an abstracted melancholic cast. After some years he grew more comfortable, and so continues, but is far from well.

Diet of the Consumptive.

“ Every body has seen the effect of milk, fruit, and vegetable diet, with more or less abstinence from fermented liquors. For three successive years the opposite method was pursued in a great number of cases by a practitioner within the sphere of my observation. His patients were supported upon animal food, strong gravy broth, and porter, or port wine. According to the most candid judgement I could form, these great variations in diet had no essential effect upon the disease; and then it was that my hopes of finding a cure for it first forsook me.*

Vitriolic Acid.

“ In the florid consumption and in hæmoptoe the use of this acid has been generally approved, but I think its effects are very problematical. The patients generally like the medicine at first, but I have repeatedly observed that in a few days it has occasioned an increase of oppression, a

* In a subsequent letter to Dr. Beddoes, Dr. Withering has the following passage:

“ I am now satisfied that phthisis pulmonalis patients gain much more than they lose by one meal of animal food in the day, and that even salted meat, as bacon, may be taken with advantage. Possibly a second meal of this kind may be borne, but my trials are yet too few to authorize any assertion on that point. But I do not hesitate to say, that all fermented liquors do mischief, as does also a daily use of opium.”

straighter cough, more heat, and if persisted in, an hæmoptoe, though none had appeared before. This also favours your theory.

Carbonic Acid Air.

“ In the case which I saw perfectly cured by means of this air, and which I communicated to Dr. Percival many years ago, the expectorated matter was very copious and very offensive. It was with a view to correct this fœtor and by that means to diminish the hectic fever, that I thought of directing its use. I found the patient in the state just now mentioned, and had the satisfaction of seeing her cured. Further and more mature observation has long since convinced me that this was a case of vomica and not a true phthisis. Accordingly I took the first fair opportunity of confessing my error, as may be seen in the Appendix to my account of the Foxglove. But though my hopes founded on this first trial proved deceptive, I am still very much deceived if the inspiration of carbonic acid air has not greatly prolonged the existence of many truly phthysical patients. My mode of using it is more effectual than you may have supposed. I order the patient to sleep in a small room; take care to have the chimney on one side of the bed, and place an earthen vessel which will contain two or three gallons on the opposite side, on a level with the pillows. It is contrived that the effervescence goes on slowly, and continues for

great part of the night, the vapour as it rises passing over the patient's bed. If the sick are so ill as to be confined to the house, the same process goes on through the day. You will probably find other aeriferous fluids better adapted to the cure of the disease, but I think you will observe good effects from this, particularly when the expectorated matter is fetid.

Vapour of Gums and Resins.

“ Many people are persuaded that consumptive patients have found good effects from inhaling the vapours of resinous or gummy resinous substances. The powder of these substances is directed to be sprinkled upon a fire in a chafing-dish, and the patient inhales the vapour as it rises. But here a question presents itself, whether the benefit should be attributed to the vapour of the medicine or to that of the burning charcoal? Japaners are constantly breathing the vapours of resinous substances, but I never could observe that they were more or less subject to phthisis than others. Casters of fine brass work very often die consumptive, much more so than any other set of artists in Birmingham. They dust their moulds with powdered resin, the vapour of which rises copiously when the melted metal is poured in. But the mischief can hardly be attributed to this vapour, otherwise the japanners would be affected, nor yet to the fumes of zinc which are copiously diffused through the workshops, be-

cause the casters of large brass work are not peculiarly liable to become consumptive. I suppose the phthisis in these instances to be caused by the mechanical action of the powdery matters which float in the air in great quantities in these fine casting shops, and are necessarily taken in with the breath. Whilst flints for the potteries were pounded in mortars, the people so employed universally died consumptive, and the grinders of needles now often experience the same fate.

Effect of Diet on Respiration.

“The experiments you wish for on this subject have in part been made. The late Mr. Spalding, who did so much in improving and using the diving-bell, was a man of nice observation, and had he not fallen a sacrifice to the negligence of his attendants, would have thrown much additional light upon more than one branch of science. He particularly informed me, that when he had eaten animal food, or drank fermented liquors, he consumed the air in the bell much faster than when he lived upon vegetables and drank only water. Many repeated trials had so convinced him of this, that he constantly abstained from the former diet whilst engaged in diving.

Carbonic Matter.

“Its effect upon living animals is yet but little known. Many people mix it with the food of

their poultry, and think it contributes to fatten them. This is much in favour of your opinion that it does absorb oxygen in the heat of the animal stomach.

" These, Sir, are such remarks as occurred to my mind on reading your observations on consumption and reflecting on the many ingenious ideas you have suggested. I shall be happy if they can be made subservient to the great cause in which you have engaged. An individual so occupied has a right to claim every assistance which his brethren can afford him: mankind have much to gain and nothing to lose by such inquiries.

" I remain,

" DEAR SIR,

" Yours, &c.

" To Dr. Beddoes. " WM. WITHERING.

" P.S. In constructing the apparatus I have no doubt but you will contrive to balance the air-vessels inverted in water, so that the patients may inspire perfectly at ease. The resistance given to inspiration by the column of water, low as it is, in Mudge's Inhaler, is so great that even a healthy person cannot long persevere in breathing through it, and I have never seen a patient use it so as to draw the air through the water as its author intended should be done."

*Observations on the Temperature, Climate, &c. of
the South of Europe and the West of England.*

*Extract from the PORTUGUESE LAWS concerning
those who died of CONSUMPTION. (Translation.)*

AMONG the registers of the Board of Health, which contain the regulations, laws, decrees, and orders of the said Board, is a book still extant, bearing the following title or note, "This book was revised by the order of the Senate, under the Presidency of the Count d'Aveiras John da Silva Telho, Grand Director of the Board of Health, and under the Judge Andro Treire de Carvalho; to their zeal is to be attributed the improvement of the said book, which was necessary from the inaccuracy of the original, preserved at the office of the Senate, 1704." In that book is to be seen, from the 28th to the 40th page, the regulation given by King Don John III. addressed to Pedro Vas, at Thomar, the 27th September, 1526, by Bartholomew Fernandez, and bearing the sign-manual of the said monarch. This regulation was confirmed by an edict, to be seen in the same book, pages 41, 44, and 48. In the same book, on the reverse of the page 48, are the directions to be observed on the demise of consumptives, to the following effect:—"The eighth of the month of June, in the year 1639, in this town of Lisbon, at the Board of Health, was asserted and declared, by Dr. Manuel Homem, Grand Director of the

Board, that being informed of certain consumptives dying in this town, and that, at their demise, their effects were sold at different places, by which the contagion of that dangerous disease was spread and some deaths occasioned: with regard to the aforesaid consumptives, he orders, That the Officers of Health, on inscribing those who die for burial, if they find their deaths to have been caused by consumption, are required to make the said facts known to the Director of Health, who will order them to repair to the house where the consumptive died, there to take information, upon oath, of the linen and garments worn by the deceased, which they will collect together, and, as it shall appear to the physician who attended the deceased, they will cause the said garments to be burnt, that is, such as may be dangerous; or, if some of the effects of the deceased are allowed to be sold, they must be bought with such caution as the nature of the case shall require."

Register of CONSUMPTIVES (British Subjects) who died at Lisbon, between December 4, 1791, and February 23, 1793, a Period of Thirteen Months and Three Weeks, Twenty-Two in Number, One-Third of whom died within One Week after landing, as certified by the Protestant Clergyman, the Rev. Herbert Hill, M.A. Chaplain to the British Factory.

1791.

Dec. 4, Louisa Healde, about two days after landing.

7, Daniel Whitaker, of Manchester.

1792,

Jan. 22, John Colclough, Ireland, *æt.* 22.

23, Thomas Loftus, *æt.* 42.

Feb. 23, Hon. William Forbes, *æt.* 23.

25, John Birch, Birmingham, *æt.* 41.

—, George Rome, London, *æt.* 60.

May 10, William Eaves Patrick, Birmingham, *æt.* 23.

20, Rev. G. De Butts.

Oct. 29, James Jackson, Petersburg, *æt.* 24.

Dec. 7, John Cullen, *æt.* 37, about a week after landing.

18, Rev. — Ainslie, *æt.* 30.

1793,

Jan. 6, Elizabeth M'Intosh, *æt.* 37, about a week.

22, Sarah Garforth, *æt.* 25, two or three weeks.

27, Robert Coddington, *æt.* 20, a few days.

Feb. 3, Neil M'Bryan, *æt.* 19, a few days.

—, Thomas Stephenson, *æt.* 25.

4, Emma Grosvenor, *æt.* 26, a few weeks.

8, Rev. — Draycott.

19, Henry Fombelle, *æt.* 23.

23, Owen Lloyd, *æt.* 20.

—, Sophia Rebecca Storie, one day only.

*Extract of a Letter from Mr. PATRICK GOOLD,
a respectable Medical Practitioner, long resident
in Lisbon, addressed to Dr. WITHERING, 1799.*

“ WITH respect to the native Portuguese being liable to pulmonic consumption, I must inform you that they are. The greater number of consumptive patients that I have seen for three years were venereals, patients after typhus and pleuritic

disorders. A Portuguese physician of extensive practice, generally consulted by this class of patients, states, that he frequently meets with phthisis pulmonalis, beginning with active hemoptoe, quicker in its termination, more or less, according to situation and medical treatment, and that he does not so frequently meet with tubercles on the lungs or phthisis scrofulosa."

From SAMUEL CAVE, M.D. *of Abergavenny, to*
Dr. WITHERING, May, 1795.

"I form great expectations from the pamphlet you are pleased to tell me you have in hand and I sincerely wish you health to complete both that and the new edition of your botanical works. Judicious observations on the climates and situations of places best adapted to phthisical patients, and by a person who has himself visited them, may prove an useful publication. In *North Devon*, I mean in the neighbourhood of Barnstaple, Torrington, and South Moulton, I thought I observed as many instances of phthisis as elsewhere. I could not help regretting, during my stay at *Lisbon*, that the accommodations of the place were so few, and so little suited to the taste and circumstances of the English who resort thither. Dr. Warren, an ingenious physician of Taunton, whom I met there, and who

frequently consulted me in his own case, complained much of this. He assured me that the vexation this occasioned him more than counteracted the benefit he received from the climate, and that he was determined, on this account, not to recommend Lisbon to any of his phthysical patients. Nor is he singular; I have known others express the same sentiments. In private houses, for example, there are few or no chimneys, and the English, accustomed to fire, feel the want of it much more than the natives. Even in that climate, the winter evenings are cool enough to render a little fire very agreeable, and in the day-time in January and February, when the wind blows fresh from the east, and the sun does not appear, the temperature of the air is far from warm. Down in the town, (I took up my quarters at Buenos Ayres, an eminence towards Belem,) what with the filth and nastiness, there is no living. At *Cadiz* these inconveniences are not felt. Further removed to the south, fire there is not so much wanted; it is, besides, a neat well paved town, and, being situated on a flat, the patient may use the exercise of riding or walking much more commodiously. At *Gibraltar* the accommodations are yet more to his satisfaction, because there the patient is among his own countrymen. I have made the circuit of the whole peninsula of Spain and Portugal, the soft air of which seems well adapted to cases in which the rigour of a northern climate is to be avoided. In *Catalonia* and *Valentia*,

vegetation, I observed, was particularly luxuriant. Next to climate, the comfort and accommodation of the patient might be considered, for want of which he often repents the voyage and sickens to return."

*From E. MOORE, M.D. to Dr. WITHERING,
from Cadiz, February 24, 1794.*

"THERE are no springs of any sort in *Cadiz*; the houses are built with flat roofs, on which the inhabitants contrive to catch the rain-water. It is preserved in wells, of which almost every house has one. This water is kept for common uses, and is frequently in very small quantities. The city is entirely supplied with fresh water from Port St. Mary's, where there is only one spring, which is kept under lock and key. *Cadiz* is a city remarkable for its cleanliness, and I think would, in course of time, be particularly well adapted for invalids: at present, strangers would find no accommodation: the inns are bad, and a furnished lodging is not to be procured. There is very excellent goat's milk, and plenty of fish. The city is well paved, and adjoining to it are very pleasant walks, to which, and in which, people may be carried in sedan-chairs, which are well regulated, and comfortable to an invalide. The climate appears to me to be much

better than that of Lisbon ; it is, I imagine, much warmer, and has all the conveniences of Portugal without the inconvenience. I have been here nearly a month, during which time I have constantly seen a cloudless deep blue sky.”*

Dr. John Hunter's observations on the heat of wells and springs in different climates, lead to the following conclusion, as stated in the Philosophical Transactions.

The air near the surface of the earth will show, by a thermometer in the *shade*, nearly, if not exactly, the same degree of heat that the sun communicates to our terrestrial globe ; and if a mean of the heats thus shown be taken for the year round, and we penetrate into the earth to that depth, that it is no longer affected by the daily, monthly, or annual variations of heat, the temperature, at such depth, should be equal to the annual mean above-mentioned.

To ascertain this with the utmost precision, it must be obvious, that numerous observations should be made every day, corresponding to the frequent changes of temperature which are known to happen in the course of the twenty-four hours in all climates, and upon these a daily mean should be taken, and the annual mean deduced therefrom.

* For comparative observations of Cadiz with Lisbon, *vide* Appendix, No. XVII.

Where we have observations from which a *mean temperature* can be deduced with any degree of certainty, it will be found not to differ greatly from the *heat of the deep caves or wells* in the same climate. Thus is obtained a ready method of ascertaining the mean temperature of any climate.

The best observations are to be collected from *wells* of considerable depth and not full of water. After fifty feet deep the temperature may be considered nearly uniform.

Dr. Withering, by considerable experience, verified the accuracy of such procedure, and found this method of great practical utility.

The following mean temperatures are derived from deep wells, and corroborated by other testimonies.

CORNWALL

Affords a climate decidedly advantageous in respect to warmth; the beneficial effects of which are, however, materially counteracted to the generality of invalids, by the prevalent rains, producing a humidity of atmosphere frequently injurious, and always inconvenient.

Penzance is well defended from cold aspects, the mean temperature is fifty degrees.

Marazion is still warmer, being more completely sheltered from the north-east winds.

Falmouth is too much exposed to the north-east. The mean temperature by the very deep

covered well in Pendennis Castle yard, in November, 1793, fifty degrees : the uncovered well at the same time indicated $49^{\circ} 30'$.

Flushing enjoys a full south exposure, sheltered by high grounds immediately behind it to the north. Perhaps, with the exception of damp, to which it is not peculiarly liable, this situation may be deemed the most eligible in the county.

DEVONSHIRE.

Teignmouth.—Well defended from the cold winds, the *east alone excepted*. The valley down which the brook runs into the river by Bitton-Grove is perfectly protected from cold. In May, 1794, the mean temperature appeared to be $50^{\circ} 45'$.

Dawlish.—Better defended than Teignmouth, but immediately upon the coast, rather exposed to the *east*. At a small distance, higher up the valley, well wooded, and absolutely unexceptionable.* Mean temperature, probably, about the same as Teignmouth.

Dr. Withering, on being consulted respecting this place, offers his sentiments in the following words :

“ Dawlish is well defended on the land-side by rising grounds which break the force of, nay,

* The Editor would add, from further experience, that the general advantages of South Devon are but too frequently counteracted by exposure to easterly winds, and, especially during spring and autumn, by unwholesome damps. From the former inconvenience Torquay seems peculiarly exempt.

almost exclude the cold winds from the east and north. The projecting points of land at Teignmouth, and still more the promontory of Torbay, protect it from the sweep of the western winds from the Atlantic; so that on the one side it enjoys every advantage of its southern latitude, with respect to warmth, and all that equality of temperature which belongs to the sea-air when uninfluenced by strong winds.

Its protected situation from the west, occasions the atmosphere to be less loaded with marine vapour than many other places more remote from the sea, but still within the sweep of our strong westerly winds. In consequence of this exemption, trees thrive in a luxuriant state quite to the shore.

Exmouth abounds with sea-air and marine effluviæ, but is not much sheltered from cold winds. Mean temperature, (May, 1794,) $50^{\circ} 30'$.

Sidmouth.—Not much exposed, and, at a small distance from the coast, up the valley, extremely well sheltered and wooded. Mean temperature, (May, 1794,) $49^{\circ} 45'$.

Axmouth.—A warm, well sheltered, pleasant village at a little distance from the sea-side. A fine stream runs near it.

DORSETSHIRE.

Lyme is well protected by surrounding high lands, but the country destitute of wood.

Bridport.—A clean airy town; but the moveable sands prevent sea-bathing.

HAMPSHIRE.—*Isle of Wight.*

Carisbrook-Castle.—Mean temperature, by a well 210 feet deep, (May, 1794,) 53°.* Pitt Place, on the south side of the island, appears particularly eligible for phthysical patients. The whole Under-cliff, or as near thereto as accommodation can be procured, is most desirable for invalids requiring a warm and dry climate. The difference of temperature on the north and south coasts of the Isle of Wight is greater than could be imagined in so small a space, indeed, so very considerable (as reported by an accurate resident observer) as to be scarcely credible.

On the southern shore was remarked a rich iron ore, in the form of sand, in places covering the sea-sand with a blackish hue.

SUSSEX.

Hastings is surrounded by rocks, hills, and woody country, with a southern exposure to the sea. The quantity of rain, comparatively with the west of England, is as 20 to 40 inches.†

* Though the Editor assisted in making these and the following observations, and has a clear recollection of the pains taken to insure accuracy, he cannot but suspect some error must inadvertently have arisen in this instance, more especially as by an experiment of the Rev. H. I. Close, the same well is said to indicate about 50°, which seems more correspondent with the general results of that part of the country.

† A series of thermometrical observations, taken at Goodwood, in this county, during a part of the winter of 1796-7, showed an average of temperature very nearly as high as that remarked in the Isle of Wight, during the same period.

** Thermometrical and Meteorological Observations, calculated to elucidate the Subject of Climates.*

Mr. Gough, the ingenious philosopher of *Kendal*, in Westmoreland, reports that, from a series of observations continued thrice in each day for nine years, the mean temperature of that place proves to be $46^{\circ} 74'$.

A cavern in the Limestone, near Asby, at the foot of Orton Scar, contains a basin of water 380 yards from the entrance. The temperature of this in May, when the water abounded, was 46° ; in September, when the springs were low, 48° ; mean 47° .

There is reason to apprehend, from a paper published in the *Dublin Philosophical Transactions*, that *deep covered wells* are coldest a month after the vernal equinox, from which time their temperature increases through the summer, arriving at its maximum in October.

Temperatures ascertained by Wells.

Edinburgh	45.
Kendal	46.
Birmingham, Dr. W.	46,30
Edgbaston-hall, ditto	46,30
Marlborough, May 1794.....	48,30
Newport, Gloucestershire, ditto	48.
Lamplighters' Hall, near Bristol, both in June and November.....	48.
Moreton, Devon	49.

* According to the scale of Fahrenheit, unless otherwise expressed; taken in the shade and out of doors.

Bath, the spring in Gydes' Field, taken by Dr. Watson, 1786	48,30.
Mr. Monk's well, Crescent.....	48.
Teignmouth, Dr. W. May, 1794	50,45.
Exmouth, ditto ditto	50,30.
Sidmouth	49,45.
Dawlish, near the inn, well 28 feet deep only	51.
Exeter	49.
Pendennis Castle, Falmouth, Nov. 1793, by two deep wells, the covered well..	50.
uncovered well	49,30.
Penzance, Cornwall, May, 1794.....	50.
Carisbrook Castle, in the central part of the Isle of Wight, well 210 feet deep, ditto	53.*
Isle of Wight, Pitt-place, (the well 32 feet deep, the pound of water 72f. 10in. en- closed from the air, having a pump, the thermometer standing at 44° in the shade,) the temperature of the water, Rev. H. I. Close	51.
Colbourn, the north side of the hill, well 100 feet deep, ditto.....	50.
Newport-well, 40 feet deep, ditto.....	49,30.†
Val Formosa, Mr. Bulkeley's well, near Lisbon, Jan. 1794, Dr. W.	55.
St. Jozè de Riba Mer, near Lisbon.....	54,30

* The same well by the Rev. H. I. Close, indicated not more than 50°.

† At Pitt-place, by the same observer, from Nov. 1, 1796, to Jan. 20, 1797, the highest range of the thermometer 51°.

Lowest..... 20.

The average for the month of December, 1796, taken three times each day,

Nine o'clock, a. m.....	35 $\frac{2}{3}$ °
Two p. m.....	39 $\frac{1}{2}$
Nine at night	38 $\frac{1}{3}$.

APPENDIX.

Meteorological and Thermometrical Observations, in a Series of Registers, kept at Trewarthenic and Truro, in Cornwall; Hillersden, in Devon; Yoxall, in Staffordshire; Edgbaston, in Warwickshire; Isle of Wight and Hordle, in Hants; Penzance, in Cornwall; London; Lisbon and Cintra, in Portugal; Cadiz, and Hieres.

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No. I.

*Register of the Weather, &c. at Trewarthenic, near Tregony,
Cornwall, from 1772 to 1782, both inclusive. By the
Rev. William Gregor.*

JANUARY.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest	Highest	Lowest	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	28.95	30.03	37	51	7	7	10	7	—	8	7	4	7	4	4
1773	29.13	30.11	42	52	21	2	4	—	4	6	2	1	5	—	5
1774	28.80	29.84	41	49	19	3	6	2	7	4	1	1	5	6	6
1775	29.13	29.90	43	52	21	6	—	2	5	—	8	—	5	1	5
1776	28.90	29.80	32	49	6	8	22	3	1	5	2	3	2	12	2
1777	29.19	29.96	35	53	10	7	9	2	1	7	3	2	4	1	4
1778	28.50	30.03	38	46	14	—	8	3	5	2	4	6	2	2	6
1779	29.49	30.10	39	51	10	1	11	4	2	2	3	6	2	4	6
1780	28.78	30.10	28	46	6	3	16	12	—	5	2	3	4	4	1
1781	28.97	30.20	36	48	19	4	6	3	2	1	3	3	7	4	3
1782	29.10	30.24	44	54	18	6	1	—	4	1	1	2	15	1	7

FEBRUARY.

1772	29.	29.90	33	50	18	4	6	1	4	5	7	—	3	2	4
1773	28.80	30.30	38	50	12	5	7	—	6	3	5	1	6	4	1
1774	28.80	30.20	39	50	17	3	6	1	5	2	1	4	6	—	10
1775	28.90	30.30	48	53	20	2	—	1	4	—	4	—	7	1	9
1776	28.20	29.80	37	49	20	1	—	7	1	1	—	5	2	13	
1777	28.90	29.100	38	51	12	6	6	4	1	—	—	5	4	5	5
1778	29.10	31.	41	49	6	7	4	—	5	5	5	3	4	3	2
1779	29.50	30.20	49	53	18	—	—	2	4	—	6	—	1	8	5
1780	29.20	30.30	36	49	4	4	6	6	1	2	3	2	12	—	2
1781	29.	30.10	44	51	17	—	—	3	7	7	1	1	4	—	5
1782	29.20	30.30	33	48	9	—	14	6	1	2	4	8	5	1	2

MARCH.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest.	Highest	Lowest.	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	28.80	29.70	36	52	17	—	5	6	4	—	7	2	5	3	5
1773	29.30	30.	42	53	5	—	—	7	2	4	3	—	5	8	3
1774	29.	30.	43	54	11	1	$\frac{1}{2}$	10	5	3	4	—	—	4	3
1775	28.90	30.30	46	53	15	8	1	—	7	8	2	—	13	2	2
1776	28.80	30.20	46	54	6	1	1	3	5	3	7	2	4	—	4
1777	28.90	29.90	42	56	12	—	3	3	3	1	1	5	6	6	5
1778	28.90	30.10	42	54	8	—	2	3	4	4	3	4	2	5	4
1779	29.50	30.20	49	56	9	—	—	7	2	3	1	1	4	6	6
1780	29.40	30.20	46	56	12	$\frac{1}{2}$	—	2	9	3	5	—	5	2	4
1781	29.70	30.20	43	54	4	—	$\frac{1}{2}$	9	2	3	1	5	4	3	3
1782	29.10	30.10	44	52	18	2	7h	—	4	6	—	—	10	2	7

APRIL.

1772	29.10	29.90	44	54	9	$\frac{1}{2}$	$\frac{1}{2}$	5	3	5	5	3	4	3	5
1773	28.90	30.10	44	58	13	2	—	1	4	6	2	1	11	3	3
1774	29.	29.90	49	57	14	hail	3	3	3	2	3	1	8	4	4
1775	29.40	30.10	47	57	4	—	—	7	2	—	4	1	8	4	1
1776	29.20	30.20	48	60	4	—	—	2	2	8	2	5	7	1	3
1777	29.20	30.10	44	55	10	—	—	7	3	—	2	5	2	8	2
1778	29.10	30.	47	61	15	hail	3	2	4	3	5	—	6	5	3
1779	29.50	30.20	52	59	16	—	—	4	5	2	5	—	8	1	2
1780	28.80	29.80	47	56	14	hail	3	1	4	—	5	—	9	3	5
1781	29.20	30.	44	59	10	—	—	3	2	6	2	4	4	4	2
1782	28.90	29.90	44	53	9	hail	5	7	—	—	—	3	11	5	3

MAY.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest	Highest	Lowest	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	29.20	30.10	51	60	9	—	—	7	3	4	4	4	4	5	1
1773	29.20	30.	49	68	11	hail	2	4	5	2	1	2	6	8	1
1774	29.10	29.90	52	63	10	—	—	5	1	7	3	1	2	1	2
1775	29.50	30.10	53	67	4	—	—	3	3	16	1	—	4	2	2
1776	29.30	30.20	52	63	8	—	—	5	2	7	2	6	6	2	1
1777	28.90	29.90	53	64	15	—	—	1	4	9	—	1	7	1	6
1778	29.10	30.	51	62	12	—	—	1	9	2	7	—	4	3	3
1779	29.30	29.90	51	64	12	hail	3	2	2	3	4	1	6	3	7
1780	29.10	29.90	54	66	12	—	—	1	7	1	6	—	5	3	5
1781	29.30	30.	49	69	8	—	—	7	1	3	4	6	1	4	1
1782	29.20	29.80	46	57	16	hail	2	3	3	1	3	—	8	3	7

JUNE.

1772	29.30	30.	58	67	11	—	—	4	4	2	6	—	—	2	9
1773	29.30	29.80	58	68	8	—	—	2	5	5	3	5	6	—	3
1774	29.30	29.90	56	67	11	—	—	2	5	4	2	—	5	1	9
1775	29.30	29.90	62	70	13	—	—	5	4	1	—	2	4	2	4
1776	29.30	29.90	58	68	15	hail	1	3	7	3	2	3	6	5	2
1777	29.40	30.	57	65	13	—	—	—	8	6	2	1	8	2	3
1778	29.50	30.	59	70	5	—	—	3	2	2	2	—	10	1	2
1779	29.2	29.90	60	68	8	—	—	3	1	6	—	4	9	5	1
1780	29.50	30.	58	67	15	—	—	4	2	1	1	3	15	1	3
1781	29.30	30.10	61	69	10	—	—	1	2	4	3	2	10	4	5
1782	29.40	30.10	54	70	7	—	—	3	5	3	—	1	4	2	10

JULY.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest	Highest	Lowest	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	29.20	29.90	62	70	14	—	—	6	11	2	2	1	5	2	4
1773	29.40	29.90	58	71	4	—	—	1	4	5	2	3	9	—	2
1774	29.40	29.90	59	65	12	—	—	—	3	1	2	1	10	—	9
1775	29.40	29.80	60	69	13	—	—	—	10	3	6	—	7	—	10
1776	29.20	29.90	59	68	11	—	—	1	4	—	6	0	9	2	9
1777	29.	30.	59	70	14	—	—	—	7	10	2	2	7	4	2
1778	29.30	29.90	61	73	7	hail 3	—	2	5	1	1	—	13	3	4
1779	29.20	30.	65	76	9	—	—	5	4	3	1	1	7	3	6
1780	29.40	29.84	61	70	9	—	—	2	5	2	1	3	11	1	5
1781	29.30	30.06	64	72	15	—	—	—	3	5	5	6	6	1	6
1782	29.14	30.	60	70	16	—	—	3	2	1	3	2	11	3	5

AUGUST.

1772	29.08	29.94	61	70	11	—	—	2	6	2	5	3	7	1	5
1773	29.20	29.83	60	72	5	—	—	8	4	1	5	—	6	3	5
1774	29.15	29.86	60	68	8	—	—	2	10	2	5	—	6	1	4
1775	29.22	29.68	59	69	18	—	—	—	3	3	2	—	9	—	10
1776	29.16	29.79	60	70	17	—	—	—	1	8	2	3	10	2	4
1777	29.20	29.92	60	68	8	—	—	—	1	6	4	1	—	9	3
1778	29.38	30.06	61	72	1	—	—	—	5	5	5	—	—	8	1
1779	29.47	29.80	65	75	4	—	—	—	11	4	3	1	—	5	2
1780	29.43	29.78	64	73	8	—	—	—	8	—	4	1	6	2	7
1781	29.30	29.94	64	73	13	—	—	—	7	2	4	—	—	8	4
1782	29.04	29.94	56	67	18	—	—	—	10	—	1	—	11	1	7

SEPTEMBER.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest.	Highest	Lowest.	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	28.70	29.75	58	68	16	—	—	1	6	2	2	1	4	2	4
1773	29.03	29.57	56	65	18	—	—	—	5	—	10	—	5	1	12
1774	28.72	29.76	56	66	23	—	—	2	4	4	4	2	3	2	5
1775	29.11	29.70	59	66	11	—	—	1	2	4	7	—	4	4	7
1776	28.99	29.79	58	64	9	—	—	1	1	—	1	—	8	1	2
1777	29.27	29.90	52	66	3	—	—	4	5	4	3	2	7	3	3
1778	29.12	29.98	56	66	7	—	—	6	2	2	2	1	6	5	2
1779	29.13	29.80	62	68	12	—	—	—	7	—	5	—	12	—	5
1780	29.05	29.66	59	70	13	—	—	3	5	—	6	1	4	5	3
1781	29.30	29.94	57	70	11	—	—	5	3	2	—	2	14	—	2
1782	29.35	30.07	59	66	13	—	—	8	1	2	7	1	5	5	2

OCTOBER.

Year.	Barometer.	Thermometer.	Rain Days.	Snow Days.	Frost Days.	E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
Lowest.	Highest	Lowest.	Highest										
1772	28.92	29.81	52	61	15	—	—	—	1	9	—	3	6
1773	28.95	29.90	51	61	20	—	—	4	8	2	5	—	3
1774	28.97	30.13	44	61	10	—	—	4	3	3	6	—	2
1775	29.	30.	47	64	14	—	—	1	8	2	—	2	11
1776	29.33	29.95	52	63	8	—	—	6	2	4	2	2	6
1777	28.50	29.78	51	63	11	—	—	2	8	1	—	—	5
1778	28.97	29.78	49	59	16	hail 1	—	6	5	—	2	3	7
1779	29.17	30.	53	62	16	—	—	2	8	4	2	2	6
1780	28.60	29.83	53	61	15	hail 2	—	—	3	2	4	1	11
1781	29.38	30.13	51	62	6	—	—	5	2	6	1	3	11
1782	29.25	30.17	51	61	16	—	—	3	1	8	2	2	11

NOVEMBER.

Year.	Barometer.		Thermometer.		Rain Days.	Snow Days.	Frost Days.	Wind Days.							
	Lowest.	Highest	Lowest.	Highest				E.	W.	N.	S.	N.E.	N.W.	S.E.	S.W.
1772	28.70	29.93	46	57	18	hail 4	—	—	5	3	7	2	9	—	5
1773	28.40	30.20	42	55	21	hail 3	—	—	5	—	4	3	10	—	9
1774	29.	30.10	40	52	12	hail 4	5	4	2	9	3	3	6	4	—
1775	28.98	30.03	43	55	21	—	—	11	1	5	4	1	3	4	3
1776	28.90	29.98	47	57	14	hail 2	—	—	6	2	1	2	5	3	5
1777	29.10	30.09	49	52	13	—	—	—	9	4	3	—	7	1	3
1778	29.	29.90	49	56	21	—	—	—	6	—	4	—	10	2	8
1779	28.76	30.16	45	58	8	3	3	1	3	4	—	—	13	1	2
1780	28.79	30.13	45	54	12	hail 6	—	—	5	7	2	3	11	1	—
1781	29.13	29.98	49	56	19	hail 2	1	2	3	2	6	—	9	2	4
1782	29.30	30.17	41	52	14	—	5	1	—	14	4	—	8	1	3

DECEMBER.

1772	29.10	30.01	45	54	13	—	—	8	4	1	4	—	2	3	5
1773	28.80	30.19	41	52	20	hail 2	6	2	1	4	5	5	3	6	5
1774	28.80	30.35	38	51	10	—	2	6	—	3	—	2	2	9	7
1775	28.70	30.21	45	57	12	hail 2	2	—	3	8	4	0	5	4	6
1776	29.	30.	37	55	10	2	5	—	1	5	4	2	9	10	2
1777	28.87	30.10	38	52	8	3	7	3	4	10	1	3	5	3	2
1778	28.90	30.40	47	53	14	—	—	3	8	—	5	—	1	1	9
1779	28.78	29.98	40	53	15	8	6	4	1	4	4	2	5	4	5
1780	29.53	30.14	37	48	5	—	6	14	—	5	1	1	7	2	—
1781	29.27	29.90	46	54	20	—	—	4	2	—	3	—	2	11	7
1782	29.54	30.39	43	49	9	—	—	5	6	3	1	3	10	3	1

Note.—“ A series of observations were made by the late Mr. Gregor, at Trewarthenic, extending from January, 1765, to the end of 1782, inclusive. The new, full, and quarter moons were marked throughout the whole, and clearly demonstrate that these phases of the moon have no correspondence with the changes of the weather.” Dr. Withering, and vide Appendix, No. XIX.

No. II.

Register of the Weather, kept at Truro, in the County of Cornwall; commencing in December, 1793, and ending in February, 1797, both inclusive.

L.B. The Observations were made on the Barometer and Thermometer at nine o'clock in the morning till the 3d of August, 1794, from that time at noon. Fifty parts of the Rain-Gage make one inch.

793.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
ec. 1	44	30 23	—	ENE	Moderate and cloudy
2	44	30 12	—	NE	Calm and cloudy.
3	43	30 05	—	E	Calm, a beautiful day.
4	30	30 13	—	NE	Calm, a sharp frost.
5	40	30 23	—	—	A dead calm.
6	42	30 25	—	NE	Almost calm and cloudy.
7	45	29 93	No Rain	SE	Moderate.
8	44	29 79	—	—	A dead calm and cloudy.
9	46	29 65	—	SE	Moderate.
10	50	29 17	—	S	Small rain, moderate.
11	54½	28 6	—	SW	Blew hard with showers.
12	51	29 1	—	SW	Still and cloudy.
13	53½	29 01	—	SW	A fresh gale with showers.
14	51½	29 16	— 47	SSW	Moderate and cloudy, rain.
15	46½	29 4	—	S	Calm and cloudy, a day of rain and wind.
16	49	29 14	—	NW	A fresh gale with showers.
17	50	29 68	—	WSW	Ditto with almost constant rain.
18	52	29 41	—	W	A fresh gale with heavy showers.
19	50½	29 28	—	NNW	A fresh breeze with showers.
20	50	29 32	—	SE	A fresh gale and gloomy.
21	48	29 13	3 10	SW	Ditto with heavy showers.
22	35	28 76	—	SSE	Moderate, gentle showers, a little frost.
23	36	29 08	—	NW	A little frost, a beautiful day.
24	37	29 54	—	—	Calm, bright, and ditto.
25	42	29 81	—	N	Almost calm and cloudy.
26	41	29 93	—	NE	Very moderate and gloomy.
27	44	29 78	—	SE	A fresh gale.
28	35	29 73	3 22	NE	Hard frost, bright.
29	35	29 97	—	NE	Ditto ditto
30	33	29 96	—	S	Ditto, gloomy, small thick rain.
31	43	29 49	4 14	SSE	Heavy gale and much rain.
Total	1363				

Greatest height of December, 1793 54°
Least ditto 30.

1794.	Thermometer.	Barometer.	Rain-Gauge.	Wind.	Weather, &c.
			In. Fra.		
Jan. 1	38	29 61	—	SE	Fair and pleasant.
2	26	29 89	—	NE	Very hard frost, moderate, fair.
3	25½	30 19	—	NE to SW	Ditto, fair and pleasant.
4	35	30 23	No Rain	NE to SE	Moderate, fair, and pleasant.
5	37	30 02	—	SE	Almost calm, gloomy.
6	36½	30 —	—	E to N	Moderate and cloudy.
7	33½	30 06	—	NE	A fresh breeze.
8	28½	30 2	—	E	Hard frost, a fresh breeze, bright.
9	32	30 2	—	Calm	Ditto, fog.
10	31	30 13	—	ESE	Ditto, moderate, fair, and pleasant.
11	24	29 87	No Rain	E	Ditto, ditto.
12	35	29 62	—	NNW	Ditto, and cloudy.
13	28	29 89	—	ESE	Ditto, light breeze, fair, and pleasant.
14	32	29 93	—	SW	Ditto, a thaw, fair, moderate and pleas
15	40	29 91	—	SW to NE	Rain, change of wind, & hard wind at
16	32	30 28	—	NW to NE	Frost, fair, and fresh breeze.
17	44½	30 32	—	NNW	Moderate, mild, and misty.
18	42½	30 37	— 13	W	Moderate, fair, and pleasant.
19	45	30 42	—	W	Ditto, mild, and cloudy.
20	43	30 46	—	SW	Almost calm, cloudy, but pleasant.
21	44	30 48	—	SW	Ditto, ditto.
22	42	30 48	—	SW	Moderate, bright, and pleasant.
23	47	30 01	—	WNW	Rain, fresh gale.
24	41	29 86	—	W	Fresh with showers, at night stormy wi
25	40	28 81	— 30	NW	Heavy gale, snow, hail, and showers.
26	35	29 30	—	NW	Frost, heavysqualls, snow, storm at nigh
27	41	29 03	—	NNW	Fresh gale with sleet showers.
28	36	29 31	—	W	Frost, fresh breeze, and cloudy.
29	40	29 43	—	SW	Frost, frequent showers, gloomy.
30	35	29 03	—	S	Moderate in morning, rain at 12.
31	51½	29 61	1 27	SW	Hard wind with rain, storm at night.
Total	1138				

Greatest height of January, 1794 47°

Least ditto 24.

794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
b. 1	51	29 28	—	SSW	Hard wind with rain, at night a storm.
2	50	29 23	—	W	Heavy squalls and rain.
3	35	29 84	—	NW	A white frost, fair and pleasant.
4	36	29 98	—	SE	Sharp frost, moderate, fair and pleasant.
5	45	29 85	—	S	Moderate, incessant rain.
6	43	29 70	—	SW	Ditto, mild and pleasant.
7	49	29 85	—	SW	Ditto, thick mists.
8	45	30 17	1 27	SW	Ditto, fair and pleasant.
9	48	30 31	—	SW	Ditto, ditto.
10	48	30 19	—	W	Blew hard, fair.
11	53	30 03	—	WNW	Blew very hard, hazy.
12	53	29 89	—	WNW	Ditto, bright.
13	48	29 84	—	WSW	Fresh gale, cloudy.
14	54	29 74	—	SW	Ditto, ditto.
15	54	29 65	1 37	WSW	Ditto, some showers.
16	53	29 62	—	SW	Ditto, cloudy.
17	49	29 60	—	SSW	Moderate, cloudy, and pleasant.
18	49	29 63	—	S	Ditto, thick rain.
19	50	29 72	—	SW	Ditto, fair.
20	53	29 60	—	SW	Ditto, thick rain, heavy gale at night.
21	54	29 53	—	WSW	Blew hard, rain in morn. fair afternoon.
22	53	29 51	—	SSW	Ditto, rain all day.
23	49	29 30	—	W	Ditto, showers.
24	54	29 41	—	WSW	Ditto, thick rain.
25	57	29 60	—	WSW	Ditto, ditto.
26	50	30 12	—	NW	A fresh breeze, bright.
27	53	30 14	—	SW	Moderate, cloudy.
28	49	29 78	3 10	WNW	Blew hard, with heavy showers.
Total	1485				

Greatest height of February 57°.

Least ditto 35.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Jan. 1	38	29 61	—	NE	Fair and pleasant.
2	26	29 89	—	NE	Very hard frost, moderate, fair.
3	25 ¹ / ₂	30 19	—	NE to SW	Ditto, fair and pleasant.
4	35	30 23	No Rain	NE to SE	Moderate, fair, and pleasant.
5	37	30 02	—	SE	Almost calm, gloomy.
6	36 ¹ / ₂	30 —	—	E to N	Moderate and cloudy.
7	33	30 06	—	NE	A fresh breeze.
8	28	30 2	—	E	Hard frost, a fresh breeze, bright.
9	32	30 2	—	Calm	Ditto, fog.
10	31	30 13	—	ESE	Ditto, moderate, fair, and pleasant.
11	24	29 87	No Rain	E	Ditto, ditto.
12	35	29 62	—	NNW	Ditto, and cloudy.
13	28	29 89	—	ESE	Ditto, light breeze, fair, and pleasant.
14	32	29 93	—	SW	Ditto, a thaw, fair, moderate and pleasant.
15	40	29 91	—	SW to NE	Rain, change of wind, & hard wind at 1
16	32	30 28	—	NW to NE	Frost, fair, and fresh breeze.
17	44 ¹ / ₂	30 32	—	NNW	Moderate, mild, and misty.
18	42 ¹ / ₂	30 37	— 13	W	Moderate, fair, and pleasant.
19	45	30 42	—	W	Ditto, mild, and cloudy.
20	43	30 46	—	SW	Almost calm, cloudy, but pleasant.
21	44	30 48	—	SW	Ditto, ditto.
22	42	30 48	—	SW	Moderate, bright, and pleasant.
23	47	30 01	—	WNW	Rain, fresh gale.
24	41	29 86	—	W	Fresh with showers, at night stormy with
25	40	28 81	— 30	NW	Heavy gale, snow, hail, and showers.
26	35	29 30	—	NW	Frost, heavy squalls, snow, storm at night
27	41	29 03	—	NNW	Fresh gale with sleet showers.
28	36	29 31	—	W	Frost, fresh breeze, and cloudy.
29	40	29 43	—	SW	Frost, frequent showers, gloomy.
30	35	29 63	—	S	Moderate in morning, rain at 12.
31	51 ¹ / ₂	29 61	1 27	SW	Hard wind with rain, storm at night.
Total	1138				

Greatest height of January, 1794 47°

Least ditto 24.

794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Feb. 1	51	29 28	—	SSW	Hard wind with rain, at night a storm.
2	50	29 23	—	W	Heavy squalls and rain.
3	35	29 84	—	NW	A white frost, fair and pleasant.
4	36	29 98	—	SE	Sharp frost, moderate, fair and pleasant.
5	45	29 85	—	S	Moderate, incessant rain.
6	43	29 70	—	SW	Ditto, mild and pleasant.
7	49	29 85	—	SW	Ditto, thick mists.
8	45	30 17	1 27	SW	Ditto, fair and pleasant.
9	48	30 31	—	SW	Ditto, ditto.
10	48	30 19	—	W	Blew hard, fair.
11	53	30 03	—	WNW	Blew very hard, hazy.
12	53	29 89	—	WNW	Ditto, bright.
13	48	29 84	—	WSW	Fresh gale, cloudy.
14	54	29 74	—	SW	Ditto, ditto.
15	54	29 65	1 37	WSW	Ditto, some showers.
16	53	29 62	—	SW	Ditto, cloudy.
17	49	29 60	—	SSW	Moderate, cloudy, and pleasant.
18	49	29 63	—	S	Ditto, thick rain.
19	50	29 72	—	SW	Ditto, fair.
20	53	29 60	—	SW	Ditto, thick rain, heavy gale at night.
21	54	29 53	—	WSW	Blew hard, rain in morn. fair afternoon.
22	53	29 51	—	SSW	Ditto, rain all day.
23	49	29 30	—	W	Ditto, showers.
24	54	29 41	—	WSW	Ditto, thick rain.
25	57	29 60	—	WSW	Ditto, ditto.
26	50	30 12	—	NW	A fresh breeze, bright.
27	53	30 14	—	SW	Moderate, cloudy.
28	49	29 78	3 10	WNW	Blew hard, with heavy showers.
Total	1485				

Greatest height of February 57°.

Least ditto 35.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Mar. 1	46	29 68	—	W	Blew hard with rain morn. mod. & fair aft.
2	46	29 64	—	WNW	Blew fresh, some showers, a stormy night
3	51	29 60	—	SW	Blew very hard, with rain.
4	52	29 64	—	SSW	Ditto, dry.
5	48	29 86	—	WNW	Fresh and fair.
6	52	30 —	—	SSW	Fresh showers.
7	—	—	—	SSE	Very fresh, fair.
8	48	29 91	— 45	E	Blew fresh, fair and drying.
9	49	29 87	—	SSE	Very moderate, cloudy.
10	52	29 68	—	SW	Blew hard, in the morning rain.
11	50	29 43	—	SW	Ditto, showers.
12	51	29 42	—	W	Ditto, frequent showers.
13	48	29 67	—	WSW	Fresh wind, some showers.
14	49	29 94	—	SW	Hard wind, ditto.
15	53	29 89	1 39	SW	Ditto, rain.
16	54	29 86	—	SW	Moderate, fair and pleasant.
17	56	29 86	—	SW	Light wind, fair.
18	55	29 36	—	SSW	Hard wind, heavy rain in the night.
19	51	29 50	—	WSW	Heavy squalls, with rain.
20	54	30 —	—	N	Fresh wind, fair.
21	51	30 24	—	E	Moderate, and fair.
22	51	30 21	2 29	E	Ditto.
23	49	30 03	—	E	Ditto.
24	48	30 —	—	E	Light wind and cloudy.
25	51	30 11	—	E	Ditto.
26	56	30 03	—	E	Ditto, fair and pleasant.
27	56	29 96	—	E	White frost, fair and pleasant.
28	59	29 94	—	E to S	Blew fresh, at night heavy rain.
29	58	29 64	3 12	W	Fresh wind and showers.
30	57	29 50	—	SW	Ditto, ditto.
31	54	29 33	3 40	WSW	Hard wind, thunder-storm, much rain.
Total	1575				

Greatest height of March 59°.

Least ditto 46.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
April 1	54	29 34	—	W	Frosty morn. fresh wind all day, with showers.
2	56	29 35	—	S	Blew fresh, rain all day.
3	55	29 33	—	SW	Blew hard, ditto.
4	52	29 30	—	W	Blew very fresh, much rain.
5	59	29 60	1 24	W	Ditto, rain all day.
6	60	29 —	—	W	Ditto, much rain.
7	62	28 80	—	W	Fresh wind, frequent showers.
8	60	28 92	—	N	Ditto, fresh showers.
9	53	29 50	—	N	Heavy gale, little rain.
10	54	29 72	—	N	Moderate, and dry.
11	53	30 —	—	SSW	Gentle breeze, and pleasant frosty morning.
12	50	30 10	2 40	N	Fresh wind, fair and drying.
13	55	30 —	—	NW	Gentle breeze, fair and pleasant.
14	60	30 —	—	NW	Ditto, ditto.
15	60	29 89	—	NW	Ditto, showers in morning.
16	65	30 10	—	W	Moderate and fair.
17	66	30 25	—	S	Ditto, ditto.
18	60	30 10	—	SE	Ditto, ditto.
19	64	29 90	2 46	SSE	Ditto, ditto, little rain.
20	65	29 95	—	W	Ditto, ditto.
21	64	30 —	—	SE	Ditto, and pleasant.
22	66	29 80	—	SE	Fresh wind and cloudy.
23	63	29 60	—	SE	Ditto, and very cloudy.
24	63	30 —	—	SW	Light breeze, very fair.
25	64	30 20	—	S	Ditto, ditto.
26	63	30 10	3 6	W	Ditto, fair and pleasant.
27	65	30 —	—	W	Ditto, ditto.
28	66	30 —	—	W	Blew fresh, fair day.
29	63	30 05	—	W	Ditto, cloudy.
30	64	29 80	3 6	—	Ditto, ditto.
Total	1804				

Greatest height of April 66°.

Least ditto 50.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
July 1	72	30 —	—	WNW	Blew fresh, shower in morning.
2	70	30 10	—	W	Light wind, dry and cloudy.
3	70	30 10	—	NW	Rain morning, fair all day.
4	71	30 10	—	S	Light wind, very fair.
5	71	29 90	— 17	E	Ditto, ditto.
6	74	29 75	—	ESE	Rain in morning, thunder, cloudy all
7	75	29 80	—	SE	Showers all morning, fair all day.
8	77	29 80	—	S	Little wind and fair.
9	75	29 90	—	N	Ditto, ditto.
10	74	30 15	—	N	Ditto, fair and pleasant.
11	72	29 83	—	N	Ditto, ditto.
12	73	29 90	— 47	NE	Fresh wind in morning, fair all day.
13	71	29 90	—	NW to SW	Light wind and cloudy.
14	72	30 —	—	SW	Little wind and fair.
15	74	30 —	—	SW	Ditto, ditto.
16	72	29 90	—	WSW	Ditto misty morning.
17	68	29 90	—	SW	Little wind and cloudy.
18	70	29 90	—	WSW	Light wind and fair.
19	74	29 90	Empty	SW	Ditto, ditto.
20	72	29 90	—	S to W	Fresh wind and fair, showers.
21	68	29 85	—	S	Light wind and fair.
22	66	29 70	—	S	Little wind and much rain.
23	64	29 20	—	S	Blew hard all day, heavy rain.
24	64	29 50	—	NW	Light wind and showers.
25	63	29 70	—	S	Fresh wind and fair.
26	65	29 68	1 37	SW	Light breeze and cloudy.
27	68	29 60	—	S	Light wind and rain.
28	69	29 80	—	SW	Ditto and showers.
29	67	29 80	—	SE	Nearly calm, dry and cloudy.
30	65	29 80	—	WNW	Fresh wind and fair.
31	66	29 60	3 6	NW	Light wind, rain in evening.
Total	2162				

Greatest height of July 77°

Least ditto 63.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Aug. 1	64	29 40	—	W	Heavy gale with-showers.
2	63	29 50	—	NW	Fresh wind ditto.
3	63	29 70	—	NW	Ditto rain.
4	64	29 70	—	NW	Ditto few showers.
5	65	29 75	—	S	Thick incessant rain, moderate.
6	66	29 56	—	NW	Continuation of rain all day and night.
7	69	29 50	—	NW	Rain in morning, moderate and fair.
8	66	29 85	—	N	Moderate, fair, and pleasant.
9	65	30 05	1 39	N	Ditto, ditto.
10	65	30 14	—	WNW	Ditto, ditto.
11	71	30 05	—	NW	Ditto, ditto.
12	71	30 10	—	NW	Ditto, ditto.
13	75	30 15	—	SE	Ditto, ditto.
14	69	30 —	—	N	Ditto, ditto.
15	68	29 85	—	N	Ditto, ditto.
16	71	29 70	1 45	SSE	Moderate, close, with thick mist.
17	68	29 73	—	SSW	Thick rain, fair afternoon.
18	68	29 80	—	SW	Moderate, light showers, fair afternoon.
19	65	29 87	—	N	Ditto, fair.
20	67	30 —	—	NW	Ditto, ditto.
21	69	30 10	—	NW	Ditto, ditto.
22	67	30 10	—	SW	Moderate, hazy with mist.
23	64	30 —	2 2	NW	Moderate and fair.
24	63½	29 87	—	SW	Ditto, ditto.
25	65	29 65	—	W	Ditto.
26	66	29 68	—	SW	Hazy, with some mist.
27	63	29 70	—	W	Blew hard, heavy showers.
28	65	29 42	—	W	Moderate and fair.
29	59	29 80	—	SE	Ditto rain.
30	70	29 60	—	W	Ditto rain in afternoon.
31	67	29 63	3 12	NW	Fresh, with showers.
Total	2062				

Greatest height of August 75°.
Least ditto 63.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Sept. 1	66	29 75	—	W	Moderate, hazy, and showers.
2	61	29 95	—	NW	Fresh gale.
3	65	30 10	—	NW	Moderate and fair.
4	63	29 90	—	SE	Moderate, rain at night.
5	62	29 50	—	NW	Fresh wind and hazy.
6	64	29 55	14	NW	Moderate, fair.
7	65	29 45	—	N	Ditto, hazy.
8	65	29 60	—	NE	Fresh wind.
9	64	29 65	—	NNE	Blew fresh, with showers.
10	64	29 85	—	NE	Moderate, cloudy, showers.
11	64	30 —	—	NE	Ditto, fine.
12	61½	30 10	—	NE	Ditto, ditto.
13	58½	29 90	18	E	Ditto, cloudy.
14	59	29 80	—	E	Ditto, fair.
15	60½	29 70	—	SW	Ditto, rain at night.
16	61	29 75	—	S	Blew hard.
17	62	29 60	—	SW	Ditto, rain.
18	61½	29 40	—	W	Moderate, ditto.
19	56	29 20	—	SE	Stormy, ditto.
20	54½	29 50	1 37	NW	Squally, ditto.
21	59	29 70	—	W	Moderate, cloudy.
22	62	29 60	—	SW	Fresh wind, showers.
23	61½	29 30	—	SW	Ditto, ditto.
24	59½	29 45	—	NW	Ditto, ditto.
25	56	29 65	—	NW	Stormy.
26	45	29 80	—	N	Moderate.
27	51	30 05	3 02	NW	Ditto.
28	57	30 07	—	SW	Ditto.
29	58½	30 20	—	SSE	Ditto.
30	54	30 20	3 02	NW	Ditto.
Total	1797				

Greatest height of September....66°.
Least ditto 45.

94.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
t. 1	54	30 15	—	NW	Moderate and fair, frost in the morning.
2	55	30 10	—	SW	Ditto.
3	55	29 80	—	S	Ditto.
4	55	29 75	—	NW	Fresh wind.
5	54	29 30	—	SW	Stormy, rain all day.
6	53½	29 40	—	WNW	Fresh wind, fair.
7	53	29 60	—	WSW	Moderate.
8	53	29 50	—	WNW	Ditto.
9	54	29 75	—	S	Ditto.
10	60	29 40	—	S	Fresh wind.
11	54	29 40	1 20	W	Brisk wind.
12	58	29 50	—	NW	Fair and pleasant.
13	53	29 60	—	ESE	Windy, rain in the afternoon.
14	53	29 25	—	SW	Moderate, much rain.
15	56	29 75	—	SW	Ditto, cloudy.
16	52	29 90	—	SW	Mild and misty.
17	55	29 52	—	SW	Ditto ditto.
18	53	29 95	2 37	WNW	Windy, showers.
19	56	29 97	—	W	Mild, ditto.
20	59	30 —	—	NW	Ditto, cloudy.
21	56	30 20	—	NE	Fair and pleasant.
22	50	29 90	—	S to NW	Moderate, cloudy, showers.
23	50	29 80	—	N	Brisk wind, ditto.
24	49½	29 85	—	N	Moderate.
25	51	29 85	3 15	N	Ditto, fair.
26	50½	29 60	—	W	Ditto, hazy.
27	51	29 30	—	W	Ditto, rain.
28	45½	29 50	—	N	Blew hard, showers.
29	44	29 65	—	NW	Moderate, fair.
30	54	29 40	—	NW	Blew fresh, rain.
31	55	29 85	4 16	NW	Moderate, hazy, ditto.
Total	1650				

Greatest height of October.....59°.
Least ditto 44.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Nov. 1	43	29 80	—	W	Moderate, hazy.
2	49½	29 39	—	SW	Ditto, incessant rain.
3	43	29 20	—	W	Ditto, showers, afternoon stormy.
4	52	28 92	—	W to S	Very windy, heavy showers.
5	51	29 —	—	SW	Moderate, hazy.
6	46	29 20	—	SW	Ditto, fair.
7	44	29 30	—	SW	Ditto, few showers.
8	46	29 60	1 36	W	Ditto, fair.
9	50	29 70	—	SW	Ditto, rain.
10	49	29 80	—	S	Ditto, ditto.
11	44	29 90	—	WNW	Ditto, ditto.
12	53	30 —	—	W	Ditto, ditto.
13	49	30 —	—	N	Ditto, fair.
14	49	29 60	—	NW	Sharp frost, fair, beautiful.
15	51	29 97	not taken	W	Thick misty weather.
16	50	29 94	—	WNW	Fresh wind, cloudy.
17	50	29 85	—	SE	Moderate, cloudy.
18	46	29 60	—	SE	Fresh drying wind.
19	45	29 20	—	SE	Very windy, rain.
20	49	28 60	—	SE	Ditto, heavy rain.
21	50	29 05	—	SSW	Ditto, fair.
22	52	29 40	3 45	SE	Moderate, fair.
23	53	29 43	—	S	Ditto, hazy.
24	53	29 45	—	SSW	Ditto, ditto, showers.
25	52	29 50	—	SW	Ditto, ditto.
26	52	29 70	—	W	Ditto, ditto.
27	45	29 80	—	NW	Ditto, fine day.
28	51	29 29	—	SW	Brisk wind, incessant rain.
29	42	29 60	5 36	SW	Ditto, showers.
30	49	29 57	6 36	SW	Mild, incessant rain.
Total	1458				

Greatest height of November....53°.
Least ditto 42.

1794.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Dec. 1	45	29 66	—	W	Windy and showers.
2	52	29 07	—	SW	Very windy, with rain.
3	52	29 59	—	SW	Fresh wind, incessant rain.
4	49	29 49	—	SW to E	Moderate, ditto.
5	50	29 45	—	SE	Ditto, fair.
6	50	29 70	1 36	S	Ditto, ditto.
7	48	29 52	—	SW	Ditto, showers.
8	45	29 30	—	W	Ditto, heavy showers.
9	45½	29 40	—	W	Ditto, hazy.
10	43	29 80	—	W	Ditto, showers.
11	38	30 —	—	S	Ditto, frosty morning, cloudy.
12	43	30 —	—	S	Ditto, misty rain all day.
13	50	29 90	3 17	S	Ditto, ditto.
14	45	30 05	—	NW	Ditto, pleasant.
15	43	30 05	—	N	Ditto, showers.
16	41½	30 30	—	N	Ditto, pleasant, frosty morning.
17	41	30 —	—	S	Ditto, hazy.
18	38	29 90	—	ESE	Ditto, sharp frost, pleasant.
19	43½	29 60	—	S	Ditto, hazy.
20	43	29 60	3 34	SSE	Ditto, fair.
21	43	29 25	—	SE	Ditto, rain almost all day.
22	43	29 20	—	SE	Ditto, rain.
23	47	29 30	—	ESE	Ditto, hazy.
24	35	29 00	—	E	Sharp drying wind, frost.
25	33	29 65	—	NE	Hard frost, some snow.
26	36	29 63	—	NE	Fresh wind, rain, sleet.
27	37	29 75	4 43	NE	Moderate, hazy.
28	38½	30 —	—	NE	Ditto, drying.
29	39	30 10	—	E	Moderate.
30	37	30 —	—	ESE	Ditto, few showers.
31	36	30 —	4 46	E	Ditto, frost.
Total	1328				

Greatest height of December 52°.

Least ditto 33.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Jan. 1	34	30 —	—	E	Sharp frost.
2	34	30 05	—	E	Ditto.
3	33	30 —	—	E	Ditto.
4	33½	30 10	—	E	Ditto.
5	33	30 10	—	E	Ditto.
6	34	30 10	—	E	Ditto, inclined to thaw.
7	37	30 05	—	ESE	Moderate, hazy.
8	40	29 85	—	SE	Ditto, ditto.
9	38	30 10	—	N	Ditto, ditto.
10	40	30 20	—	SE	Brisk wind, ditto.
11	38½	30 25	—	SE	Moderate, fair, pleasant.
12	37	30 10	—	SE	Ditto, hazy.
13	37	30 —	—	SE	Ditto, sharp cold.
14	36½	29 90	—	ESE	Windy, hard frost.
15	29	29 80	—	NE	Ditto, ditto.
16	28	29 75	—	NE	Ditto, ditto.
17	29	29 60	—	NE	Moderate, ditto.
18	33	29 50	—	NE	Ditto, ditto.
19	29	29 50	—	NE	Ditto, ditto.
20	29	29 55	—	NE	Ditto, ditto.
21	26	29 70	—	NE	Ditto, ditto.
At 9 morn. 17	17				
22	24	29 75	—	NE	Ditto, ditto.
At 9 morn. 15	15				
23	23½	29 70	—	NE	Ditto, ditto.
24	25	29 84	—	NE	Ditto, ditto.
25	29	29 80	—	SE	Fresh wind, cloudy.
26	35	29 20	—	E to S	Thaw, rain and snow, wind brisk.
27	47	29 05	—	SW	Moderate, hazy and mist.
28	40	29 55	—	N	Windy and rain.
29	34½	29 80	—	ESE	Ditto, hard frost.
30	35½	29 90	—	SE	Ditto, ditto.
31	37	29 75	1 10	SE	Moderate, cloudy with showers.
Total	1216				

Greatest height of January 47°.

Least ditto 15.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
eb. 1	46 $\frac{1}{2}$	29 15	—	W	Brisk wind, rainy.
2	39	29 40	—	NNW	Ditto wind, drying.
3	37 $\frac{1}{2}$	29 10	—	NW	Ditto, cold showers.
4	37	29 20	—	NW to W	Blew hard, snow showers.
5	37	29 60	—	SW	Moderate, frosty morn.
6	40	29 60	—	SE	Ditto, thick mist.
7	44	29 15	1 4	SE	Ditto.
8	46 $\frac{1}{2}$	29 —	—	SSW	Ditto, cloudy.
9	50	28 90	—	SSE.	Stormy, incessant rain, heavy gale at night.
10	51	28 80	—	S	More moderate, rain continues.
11	49	28 75	—	S to W	Moderate, hazy and showers.
12	46 $\frac{1}{2}$	29 20	—	N	Ditto, cloudy, wet afternoon.
13	37 $\frac{1}{2}$	29 40	—	NE	Brisk wind, snow in the morning.
14	35	30 10	4 44	NE	Moderate, very hard frost.
15	38	30 30	—	NE	Ditto, ditto.
16	39	30 20	—	NE	Ditto, ditto.
17	38	30 25	—	ESE	Ditto, fair, thaw.
18	33	30 15	—	E	Windy, frost.
19	31	29 60	—	NE	Ditto, frost and snow.
20	32	29 70	—	NE	Ditto, frost, fair.
21	35	29 40	4 46	NE to S	Ditto, frost in morning, rain in evening.
22	43	29 04	—	SSE	Moderate, few showers.
23	44	29 35	—	SW	Ditto, ditto.
24	44	29 50	—	SW	Ditto.
25	47	29 30	—	W	Ditto, pleasant.
26	43	28 80	—	ESE	Ditto, thick rain.
27	42	29 25	—	N	Ditto, fair.
28	45	29 10	4 46	W	Ditto, cloudy.
Total	1248				

Greatest height of February.....51°.

Least ditto 31.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Mar. 1	42	29 25	—	NNW	Frosty morn. pleasant day, rain at night.
2	48	29 60	—	NW	Moderate, fair, rain at night.
3	43	30 10	—	SSE	Ditto, ditto.
4	51	29 90	—	W	Brisk wind, fair.
5	51	29 45	—	SSE	Fresh wind, cloudy, showers.
6	49	29 50	—	W	Heavy gale, fair and drying.
7	47	29 89	— 30	NW	Ditto, ditto.
8	45	29 80	—	NW	Frosty morning, rain at evening.
9	46	29 51	—	W	Moderate, rain.
10	46	29 30	—	SW	Ditto, cloudy.
11	45	29 20	—	W	Ditto, pleasant, few showers.
12	44	29 20	—	SE	Ditto, hard rain.
13	43	29 25	—	W to S	Ditto, fair, few showers.
14	47	29 20	1 0	W	Ditto, ditto, ditto.
15	47	29 40	—	SW	Ditto, cloudy, rain all night.
16	43	29 20	—	NW	Ditto, snow in morning, fair day.
17	39	29 20	—	NW	Ditto, cloudy, showers of sleet.
18	40	29 50	—	N	Ditto, ditto, ditto.
19	40½	30 10	—	NW	Ditto, ditto, sharp frost.
20	44	30 25	—	NNW	Ditto, fair and pleasant.
21	44	29 90	1 45	W	Ditto, hazy.
22	45	29 95	—	N	Ditto, ditto.
23	45	29 90	—	N	Ditto, pleasant.
24	45½	29 80	—	W	Ditto, hazy.
25	45	29 70	—	SW	Ditto, ditto.
26	45½	29 70	—	N	Ditto, ditto.
27	46	29 75	—	SW	Ditto, ditto.
28	47	29 77	1 48	S	Ditto, few showers.
29	48	29 85	—	S	Ditto, hazy.
30	49	29 75	—	SW	Ditto, cloudy, rain at night.
31	45	29 70	2 17	WNW	Ditto, pleasant day.
Total	1414				

Greatest height of March.....51°.

Least ditto 39.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
April 1	51	29 70	—	W	Moderate, pleasant.
2	49	29 55	—	SW	Ditto, thick rain.
3	47½	29 50	—	SE	Ditto, ditto.
4	46	29 95	— 34	E	Ditto, pleasant.
5	45	29 80	—	NE	Ditto, hazy.
6	46	29 82	—	N	Ditto, fair.
7	48	29 85	—	SW	Ditto, ditto.
8	47	29 87	—	SE	Ditto, ditto.
9	46	29 75	—	E	Blew fresh.
10	50	29 90	—	SE	Ditto, rain in morning.
11	48	29 85	— 49	S	Moderate, pleasant.
12	48	29 88	—	N	Ditto, fair.
13	47	29 90	—	NW	Ditto, hazy, little rain.
14	49	29 95	—	SSE	Ditto, ditto.
15	52	29 98	—	SSE	Ditto, ditto.
16	54	29 77	—	S	Fresh wind, rain at night.
17	55	29 80	—	W	Moderate, cloudy.
18	52	29 25	1 28	SW	Fresh wind, thick rain.
19	53	29 19	—	W	Moderate, fair.
20	53	29 20	—	WNW	Ditto, ditto.
21	57	29 10	—	SW	Ditto, ditto.
22	53	29 35	—	WNW	Ditto, ditto.
23	52	29 25	—	SSW	Ditto, hazy.
24	51	29 45	—	S	Ditto, small rain.
25	52	29 30	2 10	S	Fresh wind, rain all day.
26	53	29 50	—	SW	Ditto, showers.
27	54	29 70	—	SW	Ditto, ditto.
28	53	29 25	—	W	Ditto, ditto.
29	54½	29 45	—	SW	Ditto, ditto.
30	52	29 30	3 8	SW	Ditto, fair.
Total	1517				

Greatest height of April. .57°.

Least ditto 45.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Fts.		
May 1	54	30	—	N	Moderate, fair.
2	55	29 95	—	NNW	Ditto, ditto.
3	59	30	—	NW	Ditto, ditto, hoary morning.
4	60	30 15	—	W	Ditto, ditto, ditto.
5	61	30 20	—	NW	Ditto, ditto, ditto.
6	62	30 25	—	NW	Ditto, ditto.
7	64	30 30	—	NW	Ditto, ditto.
8	60	30 20	—	NW	Ditto, ditto.
9	61	30 30	—	SSW	Ditto, ditto.
10	60	30 20	—	W	Ditto, ditto.
11	55	30 5	—	NW	Fresh wind, fair.
12	54	30 20	—	NW	Moderate, ditto.
13	56	30 15	—	NW	Ditto, ditto.
14	58	30 10	—	NW	Ditto, ditto.
15	57	30	—	NW	Ditto, ditto.
16	58	29 80	—	NW to S	Ditto, ditto.
17	58	29 80	—	SE	Ditto, ditto.
18	59	29 90	—	W	Ditto, ditto.
19	60	30 10	—	WNW	Ditto, ditto.
20	59	30 30	—	NW	Ditto, ditto.
21	63	30 35	—	NW	Ditto, ditto.
22	64	30 35	—	NW	Ditto, ditto.
23	65	30 10	—	NW	Ditto, ditto.
24	65	30	—	NW	Ditto, ditto.
25	59	29 10	—	SE	Very fresh, more mod. towards evening.
26	61	30	—	E	Ditto, fair.
27	58	29 05	—	E to S.	Moderate, hazy.
28	59	29	—	NNW	Ditto, light showers in morning.
29	57	28 90	—	NW	Fresh wind, fair.
30	57½	29	—	WNW	Moderate, hazy.
31	57	29 75	— 8	SW	Ditto, cloudy.
Total	1737				

Greatest height of May.... 65°.

Least ditto 54.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
June 1	59	28 78	—	SW	Brisk wind and smart showers.
2	58½	29 40	—	SW	Moderate, few light showers.
3	58	29 35	—	SSW	Ditto, heavy rain.
4	58	29 30	—	SE	Ditto, ditto.
5	59½	29 55	—	ESE	Ditto, fair and pleasant.
6	61	29 60	1 36	NW	Ditto, ditto.
7	62	29 65	—	NNW	Fresh wind, fair.
8	59	29 70	—	NE	Moderate, hazy.
9	58	29 90	—	NE	Ditto, ditto, light showers.
10	58	29 80	—	NE	Fresh breeze, cloudy.
11	57½	29 76	—	ENE	Ditto, rain in afternoon.
12	58	29 74	—	E	Ditto, fair.
13	58½	29 75	2 9	SE	Moderate, hazy.
14	57	29 80	—	E to S	Ditto, rain at night.
15	57½	29 75	—	SE	Ditto, hazy.
16	60	30 —	—	W	Ditto, ditto.
17	63	30 —	—	N	Ditto, fair.
18	57	29 75	—	N	Fresh breeze, hazy.
19	55	29 90	—	N	Stormy, ditto.
20	57	30 —	2 22	N	Ditto, fair.
21	58	29 96	—	N	Moderate, ditto.
22	58	29 95	—	NW	Ditto, ditto.
23	60	29 90	—	S	Ditto, light showers.
24	60	29 75	—	SW	Ditto, ditto.
25	64	29 70	—	SW	Ditto, ditto.
26	65	29 65	—	W	Ditto, fair.
27	66	29 70	—	SSW	Ditto, hazy.
28	67	29 80	—	SW	Ditto, light showers.
29	66	29 75	—	WSW	Ditto, hazy, stormy night.
30	65	29 70	3 18	—	Ditto, heavy rain.
Total	1798				

Greatest height of June....67°.

Least ditto 55.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
July 1	65	29 80	—	WNW	Moderate, light showers.
2	64	29 70	—	W	Ditto, very rainy.
3	64½	29 70	—	W	Ditto, rainy morning, fair afternoon.
4	65	30 —	1 0	W	Fresh wind, hazy.
5	64½	30 05	—	NW	Moderate, fair.
6	65	30 10	—	NE	Ditto, ditto.
7	66	30 10	—	NE	Ditto, ditto.
8	65	30 05	—	E	Ditto, ditto.
9	65½	30 —	—	E to S	Ditto, ditto.
10	64	30 05	—	ESE	Ditto, hazy.
11	65	30 —	1 0	N	Ditto, fair.
12	65½	29 97	—	N	Ditto, ditto.
13	65	30 10	—	N	Fresh wind, ditto.
14	64	30 10	—	N	Ditto, ditto.
15	66	30 8	—	N	Ditto, ditto.
16	67	30 10	—	NW	Moderate, ditto.
17	66	29 95	—	W	Ditto, hazy.
18	66	29 95	1 25	SW	Ditto, ditto.
19	68	29 85	—	S	Ditto, fair.
20	69½	29 80	—	NW	Ditto, ditto.
21	68	29 70	—	S	Very fresh, hazy.
22	67	29 75	—	WNW	Ditto, light showers.
23	65	29 80	—	W	Ditto, fair, one shower.
24	63	29 77	—	NW	Ditto, few showers.
25	62	29 85	1 47	NNW	Ditto, showery.
26	64	29 90	—	W	Ditto, ditto.
27	64	29 85	—	W	Heavy gale, rain at night.
28	65	30 —	—	SW	Moderate, hazy.
29	66	29 85	—	SSW	Fresh wind, ditto.
30	65	29 83	—	NW	Moderate, fair.
31	66	29 85	2 15	NW	Ditto, ditto.
Total	2024				

Greatest height of July....68°.

Least ditto 62.

796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Fts.		
Aug. 1	66	29 80	—	NW	Brisk wind, hazy.
2	67	29 75	—	NW	Moderate, ditto.
3	66	29 85	—	N	Ditto, fair.
4	66	29 70	—	ESE	Fresh wind, rain.
5	65	29 68	—	E	Moderate, ditto.
6	67	29 74	—	S	Ditto, ditto.
7	66½	29 80	—	SW	Ditto, hazy.
8	66	29 82	— 38	S	Ditto, ditto.
9	65	29 85	—	SW	Ditto, ditto.
10	65½	29 83	—	W	Ditto, fair.
11	66	29 87	—	NW	Ditto, hazy.
12	68	29 80	—	SE	Ditto, ditto.
13	67	29 60	—	W	Ditto, hazy morning, fair afternoon.
14	66	29 65	—	W	Ditto, fair.
15	66½	29 70	— 41	SW	Ditto, hazy, wet evening.
16	65	29 74	—	NW	Fresh wind, hazy.
17	66	29 70	—	WNW	Ditto, showery.
18	67	29 72	—	W to NW	Ditto, ditto.
19	66½	29 80	—	W	Ditto, fair.
20	67	29 80	—	W	Ditto, hazy.
21	68	29 76	—	WSW	Ditto, ditto.
22	68	29 75	— 43	SW	Ditto, ditto.
23	67½	29 78	—	W	Ditto, ditto.
24	67	29 80	—	W	Ditto, fair.
25	67½	29 90	—	SE	Ditto, ditto.
26	67	29 90	—	SE to NW	Ditto, ditto.
27	68	29 95	—	W	Ditto, ditto.
28	66	29 90	—	SW	Ditto, ditto.
29	66½	30 05	—	NW	Ditto, ditto.
30	67	29 95	—	SE	Ditto, ditto.
31	67	29 90	— 45	SE	Ditto, ditto.
Total	2058				

Greatest height of August 68°.

Least ditto..... 65.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Sept. 1	66	29 70	—	SE	Moderate and fair.
2	66	29 65	—	SE	Ditto, ditto.
3	66½	29 55	—	SE	Ditto, ditto.
4	66	29 40	—	SE	Stormy and heavy rain.
5	65	29 50	—	SSE	Ditto, hazy.
6	66	29 75	—	SE	Moderate, ditto.
7	67	29 75	—	S	Ditto, ditto.
8	66½	29 90	—	S	Ditto, fair.
9	66	29 95	—	NW	Ditto, ditto.
10	67	30 10	—	NW	Ditto, ditto.
11	67	30 15	—	NW	Ditto, ditto.
12	66	30 18	—	N	Ditto, ditto.
13	65½	30 20	—	N	Ditto, ditto.
14	66	30 25	—	ESE	Ditto, ditto.
15	65	30 —	—	ESE	Fresh wind, ditto.
16	64½	29 90	—	ESE	Ditto, ditto.
17	63½	29 75	—	SE	Moderate, ditto.
18	63	29 70	—	SE	Ditto, hazy.
19	63	29 70	—	S	Ditto, rain.
20	64	29 72	—	E	Ditto, fair.
21	64½	29 85	—	ENE	Fresh wind, ditto.
22	65	29 90	—	SE	Moderate and fair.
23	65	30 —	—	N	Ditto, ditto.
24	63	30 05	—	N	Ditto, ditto.
25	62	30 10	—	N	Ditto, ditto.
26	61	30 —	—	N	Ditto, hazy.
27	60	29 80	—	ESE	Ditto, fair.
28	60	29 70	—	ESE	Ditto, ditto.
29	60½	29 70	—	SE	Ditto, ditto.
30	63	29 70	— 10	SE	Ditto, ditto.
Total	1930				

Greatest height of September 67°.

Least ditto.....60.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Oct. 1	61	29 65	—	SE to W	Moderate, rain and thunder.
2	60	29 66	—	SW	Ditto, light showers.
3	59½	29 70	1 5	NE	Squally, heavy rain and thunder.
4	58	29 85	—	N	Moderate, fair.
5	57	29 86	—	S	Ditto, heavy rain.
6	56	29 96	—	W	Ditto fair, showery morning.
7	56	29 55	—	ESE	Blew hard all day, cloudy.
8	57	29 55	—	SE	Moderate, fair.
9	56	29 —	—	W	Fresh wind, rain in morning.
10	55	29 —	4 20	WSW	Stormy, heavy showers.
11	54	29 30	—	SE	Moderate, showers.
12	53	29 40	—	SE	Ditto, incessant rain.
13	60	29 45	—	S	Ditto, fair.
14	61	29 45	—	SE	Ditto, ditto.
15	60	29 50	—	SW	Fresh wind, cloudy.
16	59	29 55	—	SW	Ditto, rain in morning.
17	58½	29 70	5 10	SE	Ditto, cloudy, fair, showers.
18	60	29 50	—	SE	Ditto, ditto.
19	60½	29 35	—	SE	Ditto, ditto.
20	59½	29 90	—	SW	Ditto, rainy.
21	58	29 50	—	SW	Squally, showers.
22	57	29 25	—	SW	Fresh wind, rain.
23	51	29 10	—	S	Moderate, hazy, wet afternoon.
24	56	29 20	6 0	SW	Fresh winds, hazy.
25	55	29 60	—	SW	Moderate, fair.
26	58	29 72	—	S	Ditto, pleasant.
27	57	29 30	—	SW	Fresh wind, rain all day.
28	56	29 25	—	SW	Ditto, showery.
29	53	29 35	—	WSW	Stormy, heavy thunder-shower.
30	52	29 40	—	W	Ditto, rain.
31	51½	29 50	7 05	w	Ditto, ditto.
Total	1763				

Greatest height of October 61°.

Least ditto 51.

1795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Nov. 1	50	29 50	—	W	Fresh wind, and rain.
2	48	29 55	—	N	Ditto, showery.
3	46	30 —	—	N	Ditto, fair.
4	48	30 —	—	SW	Moderate, hazy.
5	50	29 75	—	NW to W	Ditto, rain at night.
6	51	30 10	—	NW	Ditto, hazy.
7	53	30 20	1 0	W	Ditto, ditto.
8	53	30 20	—	SE	Ditto, pleasant.
9	50	30 25	—	E	Ditto, fair.
10	46	30 30	—	E	Ditto, ditto.
11	45	30 43	—	NE	Ditto, ditto.
12	47	30 30	—	NE	Ditto, hazy.
13	48	30 15	—	N	Ditto, ditto.
14	46	30 20	1 11	N	Fresh wind, ditto.
15	45	30 10	—	N	Moderate fair, frost.
16	43½	30 5	—	—	Calm, hazy.
17	43	30 —	—	SW	Moderate, stormy at night.
18	43½	29 05	—	SW to W	Fresh wind and incessant rain.
19	43	29 15	—	W	Moderate showers.
20	42	29 20	—	N	Fresh wind, ditto.
21	43	29 45	2 5	SW	Fair, sharp frost.
22	44	29 10	—	SW to N	Blew hard, rain.
23	45	29 5	—	SSW	Moderate, hazy.
24	45	29 5	—	W	Fresh wind, showers.
25	45	29 —	—	N	Ditto, ditto.
26	43	29 50	—	W	Ditto, rain.
27	42	29 40	—	SE	Moderate, ditto.
28	44	29 60	—	NE	Ditto, ditto.
29	48	29 75	—	SSW	Ditto, hazy.
30	50	30 —	3 10	W	Ditto, ditto.
Total	1389				

Greatest height of November 53°.

Least ditto 42.

795.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Dec. 1	52	30 05	—	W	Moderate, hazy.
2	50	29 95	—	W	Ditto, wet morning.
3	49	30 —	—	W	Ditto, hazy.
4	48	30 10	—	NW	Ditto, ditto.
5	47	30 —	— 5	W	Ditto, ditto.
6	49	30 —	—	W	Ditto, ditto.
7	50	30 05	—	W	Ditto, ditto.
8	49	30 10	—	N	Ditto, ditto.
9	45	30 20	—	ENE	Ditto, fair.
10	46	30 10	—	E	Ditto, ditto.
11	47 ¹ / ₂	30 —	—	ESE	Ditto, hazy.
12	45	29 45	— 5	SE	Ditto, ditto.
13	48	29 30	—	SW	Blew hard, rain.
14	50	29 25	—	SW	Moderate, showers.
15	50	29 40	—	S	Ditto, hazy.
16	52	29 35	—	S	Ditto, ditto.
17	51	29 40	—	S	Ditto, ditto.
18	51	29 50	—	S	Ditto, showers.
19	48	29 45	1 —	SW	Fresh wind, hazy.
20	45	29 47	—	NW	Moderate, ditto.
21	49	29 60	—	S	Blew fresh, rain.
22	52	29 55	—	SW	Ditto, hazy.
23	49	30 20	—	WNW	Moderate, fair.
24	52	30 10	—	SW	Ditto, light mist.
25	52	30 15	—	NW	Ditto, hazy morning, wet evening.
26	48	30 21	1 46	NNE	Ditto, fair.
27	49	30 —	—	S	Ditto, hazy, frosty morning.
28	51	29 85	—	SW	Ditto, hazy.
29	52	29 70	—	SW	Stormy, rain.
30	49	30 20	—	NW	Moderate, fair.
31	48	29 90	3 5	SW	Ditto, incessant rain.
Total	1523				

Greatest height of December 52°.

Least ditto.....45.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Jan. 1	46	29 95	—	SW	Moderate, fair.
2	47	29 60	—	SW	Stormy, rain.
3	48	29 75	—	WNW	Moderate, hazy.
4	49	29 82	—	WSW	Ditto, ditto.
5	48½	29 90	—	W	Ditto, ditto.
6	48	29 85	—	NW	Ditto, rain.
7	51	29 70	—	SW	Ditto, fair.
8	49	29 40	—	SE	Ditto, hazy.
9	45	29 20	— 36	SE	Ditto, fair.
10	46	29 30	—	SE	Ditto, ditto.
11	47	29 35	—	SW	Ditto, ditto.
12	50	29 65	—	S	Stormy, rain.
13	54	29 80	—	S	Fresh wind, hazy and mist.
14	55	29 90	—	SW	Ditto, stormy, rain at night.
15	53	30 —	—	SW	Ditto, fair.
16	55	30 10	1 13	S	Ditto, ditto.
17	54	30 —	—	S	Ditto, ditto.
18	53½	29 90	—	SW	Ditto, ditto.
19	53	29 50	—	S	Fresh wind, fair.
20	54	29 40	—	S	Ditto, hazy, very stormy at night.
21	54	29 35	—	SW	Very stormy, light rain.
22	54	29 25	—	S	Moderate, hazy.
23	53	29 —	3 15	S to W	Very heavy gale, rain.
24	54	28 90	—	S	Very squally, ditto.
25	53½	29 —	—	SW	Heavy gale in morning, fresh all day.
26	50	29 05	—	SW	Blew hard all day, showers.
27	46	29 10	—	SW	Ditto, ditto.
28	45½	29 10	—	SW	Ditto, squally, with showers.
29	45	28 70	—	SW	Ditto, ditto.
30	44	28 70	—	SW	Ditto, ditto.
31	44	28 90	7 —	SW	Ditto, ditto.
Total	1547				

Greatest height of January 55°.

Least ditto 44.

Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
		In. Pts.		
43	29 —	—	W	Fresh wind, showers.
41	29 20	—	W	Ditto, hail-showers.
42	29 40	—	SW	Moderate, showers.
45	29 50	—	NW	Ditto, fair.
44	29 —	—	W	Blew hard, hazy.
43	29 45	— 42	NW	Very stormy, drying wind.
45	29 10	—	W	Ditto, showers.
45	29 50	—	NW	Fresh wind, few showers.
44	30 —	—	N	Ditto, fair.
44 $\frac{1}{2}$	30 —	—	N	Moderate, ditto.
44	29 85	—	NW to W	Ditto, rain.
44	29 80	—	W	Fresh wind, ditto.
43	29 70	2 6	NW	Very squally, showers.
43	29 80	—	NW	Moderate, ditto.
43	29 90	—	NW	Ditto, fair.
44	29 85	—	WNW	Ditto, hazy.
43	29 80	—	NW	Ditto, ditto.
43 $\frac{1}{2}$	30 —	—	W	Ditto, thick misty rain.
45	30 —	—	WNW	Ditto, few showers.
44	30 —	2 26	W	Ditto, hazy.
45	29 80	—	SSW	Ditto, ditto.
44	29 78	—	SE	Ditto, ditto.
43 $\frac{1}{2}$	29 75	—	ESE	Ditto, drying wind.
44	29 80	—	E	Ditto, ditto.
42	30 —	—	E	Ditto, ditto.
42	30 10	—	E	Ditto, ditto.
42 $\frac{1}{2}$	30 10	—	E	Ditto, ditto.
41	30 05	—	E	Ditto, frosty morning.
40	30 —	2 30	N	Ditto, drying wind.
1255				

Greatest height of February 45°.

Least ditto 40°.

1796.	Thermometer.	Barometer.	Rain-Gauge.	Wind.	Weather, &c.
			In. Pts.		
Mar. 1	36	29 80	—	NE	Blew hard, hard frost, little snow.
2	37	29 70	—	NE	Ditto, frost.
3	39	29 65	—	NE to NW	Moderate, hazy, rain and sleet.
4	36	29 80	—	NE	Ditto, hard frost.
5	33	30 —	— 3	E to S	Ditto, frost, pleasant.
6	33	30 05	—	ESE	Ditto, ditto, hazy.
7	32	30 10	—	E	Ditto, hard frost and little snow.
8	33	30 —	—	E	Ditto, fair.
9	33	29 75	—	E	Fresh wind, hazy.
10	33	29 60	—	E	Ditto, ditto.
11	44	29 60	—	E to SE	Moderate, hazy, light showers.
12	45	29 80	— 6	S	Ditto, wet morning.
13	46	29 90	—	S	Ditto, showers.
14	46½	30 —	—	S	Ditto, hazy.
15	50	29 95	—	S	Ditto, ditto.
16	54	30 —	—	N to SE	Ditto, fair and pleasant.
17	53	30 —	—	SE	Ditto, ditto.
18	54	29 95	—	SE	Ditto, ditto.
19	55	29 98	— 19	E	Ditto, ditto.
20	55½	30 10	—	E	Ditto, ditto.
21	55	30 20	—	E to S	Ditto, ditto.
22	50	30 25	—	ENE	Ditto, hoary morning.
23	49	30 10	—	SE	Ditto, hard frost.
24	47	29 90	—	N	Ditto, hazy.
25	46	29 90	—	N	Ditto, fair.
26	45	29 85	— 24	N	Ditto, ditto, hail-showers.
27	45	29 80	—	N	Fresh, hail and snow.
28	45	29 70	—	N	Ditto, fair, few showers.
29	46	29 70	—	SE	Moderate, light showers.
30	45½	29 60	—	N	Ditto, ditto.
31	48	29 60	1 2	S	Ditto, ditto.
Total	1380				

Greatest height of March.....55°.

Least ditto.....32.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
April 1	49	29 60	—	S	Moderate, light rain.
2	50	29 65	—	SW	Ditto, hazy.
3	52	29 80	—	NW	Ditto, ditto.
4	55	30 —	—	SW	Ditto, ditto.
5	54	30 —	—	N	Ditto, fair.
6	53½	30 —	—	E	Ditto, ditto.
7	53	30 05	—	E	Ditto, ditto.
8	53½	29 98	—	E	Ditto, ditto.
9	54	30 —	—	E	Ditto, ditto.
10	53	29 90	—	E	Ditto, hazy.
11	54	29 80	—	N	Ditto, ditto.
12	55	29 90	—	N	Ditto, ditto.
13	54	30 —	—	N	Ditto, ditto.
14	53½	30 05	—	N	Ditto, fair.
15	54	30 10	—	N	Ditto, ditto.
16	55	30 10	—	N	Ditto, ditto.
17	55	30 —	—	N	Ditto, ditto.
18	55	30 —	—	N	Ditto, ditto.
19	56	29 90	—	N to E	Ditto, ditto.
20	55½	29 70	—	ESE	Fresh wind, ditto.
21	55	29 70	—	S to W	Moderate, light showers.
22	56	29 95	—	S	Ditto, fair.
23	57	29 95	—	S to W	Ditto, ditto.
24	56	30 05	—	NW	Ditto, ditto.
25	55	30 15	—	NNW	Ditto, ditto.
26	56	30 20	—	NW	Ditto, ditto.
27	56	30 15	—	N	Ditto, ditto.
28	56	29 70	—	SW	Ditto, hazy.
29	57	29 30	—	S	Ditto, ditto, rain.
30	56	28 90	— 28	WNW	Ditto, ditto, ditto.
Total	1632				

Greatest height of April 57°.

Least ditto 49.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
May 1	55	29 —	—	N to E	Moderate, showery.
2	51	29 25	—	E	Ditto, ditto.
3	52	29 50	—	NE	Ditto, ditto.
4	51	29 65	—	NE	Ditto, fair.
5	51	29 70	—	NE	Ditto, ditto.
6	55	29 75	—	W	Fresh, fair, showery morning.
7	56	29 75	—	S	Moderate, hazy.
8	58	29 50	—	S	Ditto, rain all day.
9	59	29 55	—	SW	Ditto, fair.
10	58	29 45	—	SW	Ditto, hazy.
11	59	29 50	—	SW	Fresh, cloudy.
12	58	29 60	—	SW	Stormy, ditto.
13	57	29 60	—	NW	Ditto, fair.
14	56½	29 90	1 19	NW	Fresh wind, ditto.
15	57	29 90	—	NNW	Moderate, ditto.
16	57	29 90	—	N	Ditto, ditto.
17	57½	30 —	—	SE	Ditto, ditto.
18	57	29 70	—	ESE	Very stormy, ditto.
19	57½	29 60	—	ESE	Ditto, ditto.
20	57	29 55	—	ESE	Fresh wind, hazy.
21	58	29 60	—	WNW	Moderate, showery.
22	59	29 80	—	N	Ditto, fair.
23	61½	29 95	—	N	Ditto, ditto.
24	63	29 90	—	ESE	Ditto, ditto.
25	62	29 75	—	N	Fresh wind, hazy.
26	62½	29 75	—	W	Moderate, ditto.
27	62	29 75	—	WNW	Ditto, fair.
28	58	29 60	—	SW	Ditto, hazy.
29	58	29 30	—	SW	Stormy, showers.
30	57	28 85	—	SW	Very stormy, ditto.
31	57	29 30	2 32	W	Fresh, ditto.
Total	1764				

Greatest height of May 63°.

Least ditto 51.

796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
ne 1	55	29 35	—	W	Moderate, hazy.
2	52	29 35	—	SE	Ditto, showers.
3	52	29 60	—	NW	Ditto, fair.
4	54	29 90	— 5	NW	Ditto, ditto.
5	57	29 90	—	SE to W	Ditto, thick rain.
6	60	30 05	—	WNW	Ditto, hazy.
7	62	30 —	—	NW	Almost calm, sultry.
8	60	28 50	—	W	Moderate, hazy.
9	60	29 90	—	NW	Ditto, fair.
10	62	29 85	—	S	Ditto, ditto.
11	62	29 65	— 7	S to NW	Ditto, hazy.
12	62	29 —	—	W	Ditto, ditto.
13	61	29 95	—	SW	Ditto, ditto.
14	61	29 85	—	NW	Ditto, wet morning, fair afternoon.
15	61	30 05	—	NW	Ditto, fair.
16	61	30 10	—	NW	Ditto, ditto.
17	63	30 10	—	NW	Ditto, ditto.
18	63	30 15	— 19	NW	Ditto, ditto.
19	61	29 90	—	W	Ditto, ditto.
20	60	29 75	—	NW	Stormy, showers.
21	59	29 70	—	NW to SW	Moderate, rain.
22	60	29 80	—	W	Ditto, hazy.
23	62	29 95	—	NW	Ditto, fair.
24	61½	29 96	—	N	Ditto, ditto.
25	63	30 —	— 36	SW	Ditto, ditto.
26	62	29 90	—	N	Ditto, hazy.
27	62	29 85	—	SW	Ditto, fair.
28	63	29 79	—	NW	Ditto, showers.
29	61½	30 10	—	SE	Ditto, fair.
30	63	30 —	1 —	N	Ditto, ditto.
Total	1815				

Greatest height of June 63°.

Least ditto 52°.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
July 1	64	30 05	—	N	Moderate, fair.
2	65	30 —	—	NW	Ditto, ditto.
3	65½	30 —	—	W	Ditto, ditto.
4	65	29 90	—	WSW	Ditto, hazy.
5	66	29 60	—	W	Ditto, showers.
6	65	29 55	—	NW	Fresh wind, ditto.
7	64	29 50	—	WNW	Stormy, ditto.
8	64	29 40	—	W	Moderate, heavy rain.
9	63	29 60	— 40	W to NW	Ditto, ditto.
10	62	29 80	—	NW	Ditto, fair.
11	63	29 70	—	W	Ditto, rain.
12	63	29 70	—	SW	Ditto, ditto.
13	64	29 69	—	SW	Ditto, ditto.
14	63½	29 70	—	W	Ditto, ditto.
15	65	29 71	—	S	Ditto, ditto.
16	65	29 50	1 20	W	Fresh wind, ditto.
17	65½	29 48	—	SW	Ditto, ditto.
18	65	29 46	—	SW	Ditto, incessant rain.
19	64	29 48	—	SW	Ditto, rainy.
20	65	29 53	—	W	Ditto, ditto.
21	65½	29 54	—	W	Ditto, ditto.
22	64	29 55	—	SW	Stormy, ditto.
23	63	29 60	2 12	W	Ditto, ditto.
24	62½	29 65	—	SW	Fresh wind, ditto.
25	63	29 64	—	W	Ditto, ditto.
26	63	29 65	—	WSW	Ditto, ditto.
27	63	29 65	—	S	Ditto, ditto.
28	62	29 70	—	W	Moderate, ditto.
29	62½	29 75	—	SW	Ditto, ditto.
30	62	29 80	—	WNW	Ditto, fair.
31	62	29 75	3 —	SW	Ditto, rainy.
Total	1976				

Greatest height of July.....66°.

Least ditto.....62.

196.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
Aug. 1	62	29 72	—	S	Moderate, rain.
2	62	29 73	—	S to NW	Fresh wind, ditto.
3	63	29 75	—	NW	Moderate, fair.
4	63	29 78	—	NW	Ditto, ditto.
5	63	29 85	—	W	Ditto, ditto.
6	64	29 90	— 5	W	Ditto, ditto.
7	65	30 —	—	SW	Ditto, pleasant.
8	64	30 —	—	SW	Ditto, ditto.
9	65	30 03	—	WNW	Ditto, ditto.
10	65½	29 95	—	NNW	Ditto, ditto.
11	64½	30 5	—	NE	Ditto, ditto.
12	65	30 6	—	NW	Ditto, ditto.
13	65	30 10	— 5	NW	Ditto, ditto.
14	66	30 15	—	N	Ditto, ditto.
15	66	30 20	—	NE	Ditto, ditto.
16	66½	30 25	—	N	Ditto, ditto.
17	67	30 05	—	SE	Ditto, ditto.
18	66	30 —	—	E	Ditto, ditto.
19	66½	29 90	—	SE	Ditto, ditto.
20	66	29 85	—	SE	Ditto, ditto.
21	68	30 —	—	NW	Ditto, ditto.
22	68	30 —	—	NW	Ditto, ditto.
23	69	30 —	—	NNW	Ditto, ditto.
24	69	30 —	—	N	Ditto, ditto.
25	68	30 —	—	NW	Ditto, ditto.
26	67½	29 90	—	SW	Ditto, wet morning.
27	65	30 —	—	N	Ditto, fair.
28	64	30 —	—	NW	Ditto, ditto.
29	64½	30 —	—	NW	Ditto, ditto.
30	64	30 —	—	NW	Ditto, ditto.
31	62½	30 —	— 8	NW	Stormy, hazy.
Total	2021				

Greatest height of August 69°.

Least ditto.....62.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Fts.		
Sept. 1	62	29 95	—	NW	Moderate, some rain.
2	62	29 90	—	NNW	Ditto, hazy.
3	61½	29 90	— 4	NNW	Ditto, fair.
4	62	29 95	—	WNW	Ditto, ditto.
5	62	30 —	—	NW	Ditto, ditto.
6	62	29 95	—	SW	Ditto, hazy.
7	63	29 85	—	W	Ditto, ditto.
8	64	29 90	—	W	Ditto, fair.
9	65	29 90	—	SE	Ditto, hazy.
10	65	29 85	— 5	SSE	Ditto, ditto, with mist.
11	66	29 84	—	S	Ditto, hazy and close.
12	67	29 85	—	S	Ditto, ditto.
13	66	29 86	—	S	Ditto, ditto.
14	67	29 88	—	S	Ditto, ditto.
15	66	29 90	—	S	Ditto, ditto.
16	64	29 92	—	SSE	Ditto, fair.
17	66	29 80	—	SSE	Ditto, changeable, hazy, and fair.
18	65	29 79	—	NNW	Ditto, hazy and fair.
19	65	29 80	—	NW	Ditto, ditto.
20	64	29 22	—	SW	Rain, moderate.
21	65	29 35	—	SW	Moderate and fair.
22	65	29 48	—	N	Ditto, ditto.
23	64	29 55	—	NE	Ditto, ditto.
24	63	29 70	—	E	Ditto, ditto.
25	62	29 69	—	ENE	Ditto, ditto.
26	62	29 80	—	E	Ditto, ditto.
27	61	29 84	—	E	Ditto, ditto.
28	61½	29 90	—	E	Ditto, ditto.
29	61	30 —	—	SE	Ditto, ditto.
30	60	30 10	1 10	E	Ditto, ditto.
Total	1908				

Greatest height of September 67°.
Least ditto..... 61.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Oct. 1	58	30 15	—	N	Moderate, hazy.
2	58	30 15	—	N	Ditto, fair.
3	58	30 —	—	SW	Fresh wind ditto.
4	58	30 03	—	S	Moderate, hazy.
5	57 $\frac{1}{2}$	29 40	—	S to W	Ditto, much rain.
6	56	29 30	—	W	Fresh wind, ditto.
7	53	29 20	—	W	Ditto, showers.
8	53 $\frac{1}{2}$	29 30	— 47	W	Moderate, rain.
9	54	29 43	—	W	Fresh wind, showers.
10	55	29 60	—	W	Moderate, ditto.
11	54	29 50	—	W	Fresh wind, ditto.
12	53	29 40	—	W	Moderate, ditto.
13	52 $\frac{1}{2}$	29 35	—	W	Ditto, ditto.
14	49	29 40	—	SE	Ditto, ditto, hazy.
15	52	29 50	2 45	NE	Ditto, fair.
16	51	29 75	—	NNE	Ditto, ditto, frosty morning.
17	50	29 85	—	NNE	Ditto, ditto, ditto.
18	49	29 90	—	NNE	Ditto, showers.
19	51	30 —	—	N	Fresh wind, fair.
20	53	30 20	—	NW	Moderate, hazy.
21	53 $\frac{1}{2}$	30 20	—	NW	Ditto, ditto.
22	54	30 10	2 48	W	Ditto, ditto.
23	53	30 15	—	W	Ditto, showers.
24	49	30 20	—	NNW	Fresh wind, fair.
25	46	30 35	—	N	Moderate, ditto.
26	45	30 50	—	N	Ditto, ditto.
27	44	30 15	—	NE	Ditto, ditto.
28	45	30 —	—	NE	Ditto, hazy.
29	44	30 —	—	N	Ditto, ditto.
30	48	30 05	—	N	Ditto, fair.
31	50	30 10	3 5	NW	Ditto, hazy.
Total	1555				

Greatest height of October 58°.

Least ditto 44.

1796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. Pts.		
Nov. 1	52	30 15	—	WNW	Moderate, hazy.
2	52½	29 80	—	W	Ditto, showers.
3	52	29 75	—	W	Ditto, ditto.
4	49	29 60	—	NW	Fresh, ditto.
5	48½	29 90	— 25	N	Ditto, fair.
6	48	29 55	—	W	Ditto, showers.
7	49	29 60	—	W	Moderate, ditto.
8	47	29 65	—	N	Ditto, ditto.
9	45	29 70	—	N	Fresh wind, fair.
10	44	29 90	—	ENE	Moderate, ditto.
11	43	29 80	—	NE	Ditto, ditto.
12	42	29 70	— 37	NE	Ditto, hazy.
13	39	29 63	—	NE	Ditto, fair.
14	37½	29 55	—	NE	Ditto, sharp frost.
15	40	29 47	—	SW	Ditto, fair.
16	45	29 25	—	NW	Ditto, rain.
17	43	29 30	—	NW	Ditto, hail-showers.
18	40	29 32	—	N	Ditto, showers.
19	41	29 35	1 2	N	Ditto, fair.
20	35	29 36	—	NE	Ditto, hard frost.
21	38	29 40	—	NE	Ditto, ditto.
22	41	29 45	—	N	Ditto, ditto.
23	36	29 65	—	N	Ditto, fair, sharp frost.
24	38	29 75	—	NE	Ditto, hazy.
25	42	29 —	—	NE	Ditto, ditto.
26	41	30 —	1 5	NE	Ditto, ditto.
27	42	30 2	—	NE	Ditto, ditto.
28	42	30 5	—	NE	Ditto, ditto.
29	35	30 —	—	NE	Ditto, sharp frost.
30	37	29 90	1 5	NE	Ditto, hazy.
Total	1284				

Greatest height of November 52°.

Least ditto 35.

796.	Thermometer.	Barometer.	Rain-Gage.	Wind.	Weather, &c.
			In. pts.		
ec. 1	33	30	—	NE	Moderate, frost.
2	32	29 96	—	NE	Ditto, ditto.
3	30	29 80	—	ENE	Ditto, ditto.
4	33	29 78	—	W to NE	Ditto, showers of sleet.
5	35	29 80	—	N to W	Ditto, fair, frost.
6	36	30	—	N	Ditto, ditto, ditto.
7	35	31	—	NW	Ditto, ditto, ditto.
8	37	30 20	—	N	Ditto, hazy.
9	33	30 24	—	NE	Ditto, hard frost.
10	28	30 35	— 21	NE	Ditto, ditto.
11	29	30 25	—	NE	Ditto, ditto.
12	30	30 20	—	NE	Ditto, ditto.
13	35	30 20	—	NE	Ditto, thaw, hazy.
14	37	30 10	—	NE	Ditto, ditto.
15	38½	29 95	—	NE	Ditto, ditto.
16	35	30	—	NE	Ditto, ditto.
17	34	29 80	—	NE to E	Fresh wind, hazy, little rain.
18	45	29 30	—	S	Moderate, ditto.
19	48	29	—	S	Ditto, ditto.
20	48	29 40	—	W to N	Ditto, ditto.
21	46	29 50	—	E	Ditto, rain.
22	43	29 20	—	NE	Ditto, hazy, rain.
23	36	29 10	—	NE	Ditto, snow all day.
24	28	29 50	—	NE	Ditto, sharp frost, fair.
25	35	29 30	—	E	Fresh wind, thaw, hazy.
26	36	29 12	—	E	Very stormy, much rain.
27	38	29 20	—	ESE	Ditto, ditto.
28	44	29	—	S	Moderate, hazy.
29	51	29 20	—	SW	Ditto, ditto.
30	51	29 20	—	SW	Stormy, rain.
31	51	29 45	—	SW	Moderate, ditto.
Total	1170				

Greatest height of December 51°.

Least ditto 28.

No. III.

Register of Thermometer kept at Ramscomb, near Kingsbridge, Devon, from November 1, 1794, to May 8, 1795, by Thomas Babington, M.D.

Also at Hillersdon, near Collumpton, Devon, from May 8, 1795, to the end of that Year, by the same Observer.

Compared with Observations for a Part of the same Period, (viz. from November, 1794, to June, 1795, inclusive,) taken at Yoxall-Lodge, near Lichfield, Staffordshire, by the Rev. Thomas Gisborne.

Observations at Ramscomb compared with Yoxall.
1794.

Nov.	Rams- comb. $\frac{1}{2}$ p.8 a.m.	Yoxall. $\frac{1}{2}$ p.9 a.m.	Kings- bridge. 9 a. m.	Dec.	Rams- comb. $\frac{1}{2}$ p.8 a.m.	Yoxall. $\frac{1}{2}$ p.9 a.m.	Kings- bridge. 9 a. m.
1	54	48	—	1	48	44	—
2	52	50	—	2	52	46	—
3	49	50	—	3	52	48	—
4	48	50	—	4	52	50	53
5	52	48	—	5	50	50	51
6	50	50	—	6	45	48	44
7	50	48	—	7	50	42	52
8	48	48	—	8	48	44	50
9	48	44	—	9	50	46	51
10	50	46	—	10	40	40	42
11	54	44	—	11	36	40	34
12	52	46	—	12	48	44	47
13	50	46	—	13	49	44	50
14	44	48	48	14	46	42	48
15	48	48	51	15	36	40	34
16	51	48	—	16	36	38	34
17	50	48	49	17	35	36	34
18	48	36	43	18	35	34	31
19	46	38	43	19	43	36	34
20	48	38	—	20	45	34	45
21	50	44	53	21	46	32	46
22	50	46	53	22	44	34	45
23	50	48	55	23	47	32	48
24	52	48	55	24	36	30	34
25	52	46	53	25	30	29	27
26	46	46	51	26	34	34	34
27	42	44	51	27	36	34	35
28	50	42	54	28	38	34	38
29	44	46	46	29	35	34	34
30	50	42	53	30	30	34	28
				31	36	34	—
Total	1478	1374		Total	1308	1207	

Greatest height of the three places in Nov. 1794, Kingsbridge, 55°.
Least height of ditto ditto, Yoxall, 36.
Greatest height of the three places in Dec. 1794, Kingsbridge, 53.
Least height of ditto ditto, Kingsbridge, 28.

Observations at Ramscomb compared with Yoxall.
1795.

Jan.	Rams- comb. ½p.8 a.m.	Yoxall. ½p.9 a.m.	Kings- bridge. 9 a.m.	Feb.	Rams- comb. ½p.8 a.m.	Yoxall. ½p.9 a.m.	Rams- comb. ½p.9 a.m.	Kings bridge 9 a.m.
1	38	38	38	1	41	32	42	—
2	37	24	37	2	38	30	39	—
3	26	20	26	3	35	28	35	—
4	28	20	28	4	33	28	35	—
5	32	22	—	5	34	28	35	—
6	34	24	—	6	38	16	39	—
7	42	26	—	7	42	28	42	—
8	38	24	—	8	44	32	46	—
9	36	24	—	9	50	36	51	—
10	37	22	—	10	52	44	50	—
11	33	24	—	11	48	44	49	—
12	35	24	—	12	41	40	42	—
13	39	26	—	13	34	34	35	—
14	34	26	—	14	30	30	31	—
15	30	22	—	15	35	34	36	—
16	26	22	26	16	38	38	39	—
17	27	26	26	17	36	32	36	—
18	28	30	29	18	32	30	31	—
19	28	26	30	19	30	28	30	—
20	22	26	22	20	28	28	28	—
21	20	26	—	21	38	30	39	—
22	22	26	—	22	43	34	44	—
23	24	26	22	23	41	38	42	—
24	14	24	—	24	41	38	42	—
25	27	22	27	25	43	36	44	—
26	34	20	34	26	42	32	42	—
27	48	28	49	27	40	36	42	—
28	42	32	40	28	40	32	40	—
29	32	26	32					
30	34	14	34					
31	36	24	35					
Tot.	983	764		Tot.	1087	916	1106	

Greatest height of the three places in January, 1795, Kingsbridge, 49.
Least height of ditto ditto, Yoxall, 14.
Greatest height of the three places in February, 1795, Ramscomb, 52.
Least height of ditto ditto, Yoxall, 16.

Observations at Ramscomb compared with Yoxall.

1795.

Mar.	Rams- comb. ½ p. 8 a.m.	Yoxall. ½ p. 9 a.m.	Rams- comb. ½ p. 9 a.m.	Kings- bridge 9 a.m.	April	Rams- comb. ½ p. 8 a.m.	Yoxall. ½ p. 9 a.m.	Rams- comb. ½ p. 9 a.m.
1	28	26	32	30	1	47	46	47
2	40	32	40	39	2	48	48	48
3	37	34	38	38	3	47	40	47
4	46	38	46	48	4	42	40	43
5	49	44	49	48	5	47	38	47
6	46	46	46	47	6	47	40	49
7	44	40	44	46	7	47	40	50
8	36	30	40	—	8	47	40	49
9	46	36	46	48	9	48	40	50
10	44	34	46	47	10	51	40	53
11	41	36	42	44	11	54	42	58
12	40	32	44	39	12	50	42	53
13	37	36	41	38	13	54	44	56
14	44	32	46	44	14	54	44	57
15	40	28	42	42	15	51	46	53
16	40	34	38	42	16	51	44	53
17	36	32	36	36	17	47	44	48
18	36	32	37	39	18	51	46	53
19	34	32	36	36	19	45	—	50
20	41	38	46	43	20	50	—	52
21	44	36	44	45	21	50	—	52
22	45	46	46	—	22	49	—	51
23	42	40	46	46	23	49	—	51
24	41	40	47	48	24	49	—	51
25	46	42	46	48	25	52	—	52
26	45	44	46	48	26	49	—	50
27	45	42	48	46	27	52	48	53
28	43	36	46	44	28	46	48	46
29	48	38	50	50	29	47	40	48
30	49	42	50	49	30	48	40	50
31	47	44	49	48				
Tot.	1300	1142	1353		Tot.	1469		1520

Greatest height of the three places in March, 1795, Kingsbridge, 50°.

Least height of ditto ditto, Yoxall, 26.

Greatest height of the two places in April, 1795, Ramscomb, 58.

Least height of ditto ditto, Yoxall, 38.

Observations at Ramscomb compared with Yoxall.
1795.

May	Rams- comb. ½p.8 a.m.	Yoxall. ½p.9 a.m.	Rams- comb. ½p.9 a.m.	June	Hillers- don. ½p.8 a.m.	Yoxall. ½p.9 a.m.	Hillers- don. ½p.9 a.m.
1	49	44	51	1	58	50	59
2	53	48	56	2	59	46	59
3	53	46	56	3	58	50	60
4	54	44	56	4	58	54	61
5	59	52	64	5	65	58	67
6	62	54	63	6	60	60	65
7	61	50	—	7	56	50	60
8	Hillers-	48	Hillers-	8	57	50	61
9	don.	38	don.	9	53	46	53
10	53	44	—	10	53	48	60
11	51	44	—	11	62	50	60
12	51	44	—	12	55	46	55
13	55	48	—	13	53	46	64
14	57	42	—	14	53	46	60
15	55	48	—	15	55	48	60
16	54	40	—	16	60	52	62
17	56	46	—	17	59	54	61
18	57	50	60	18	60	48	61
19	60	54	60	19	45	48	48
20	60	50	60	20	48	48	50
21	57	52	59	21	53	48	54
22	62	58	66	22	53	48	61
23	62	54	66	23	59	50	61
24	62	50	66	24	57	52	59
25	57	45	57	25	60	52	62
26	48	44	54	26	61	54	63
27	50	40	57	27	61	52	61
28	48	44	57	28	55	—	59
29	57	50	57	29	61	—	62
30	55	56	57	30	57	—	60
31	57	48	60				
Total		1475		Total	1704		1788

Greatest height of the two places in May, 1795, Hillersdon, 66°.
Least height of ditto ditto, Yoxall, 38.
Greatest height of the two places in June, 1795, Hillersdon, 67°.
Least height of ditto ditto, Hillersdon, 45.

Observations taken at Hillersdon, Devon.
1795.

July.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.	August.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.
1	59	62	1	61	63
2	61	62	2	61	63
3	57	58	3	59	61
4	60	63	4	62	68
5	63	63	5	66	66
6	59	61	6	63	67
7	62	66	7	61	66
8	57	63	8	61	63
9	55	60	9	62	64
10	55	60	10	62	67
11	55	57	11	66	70
12	55	55	12	65	69
13	59	63	13	67	70
14	57	61	14	64	68
15	63	65	15	63	66
16	62	65	16	62	65
17	61	63	17	62	64
18	61	64	18	60	64
19	59	61	19	66	68
20	59	65	20	66	69
21	61	65	21	66	69
22	57	59	22	62	65
23	55	57	23	64	68
24	57	59	24	66	68
25	59	61	25	66	67
26	59	63	26	66	68
27	65	65	27	61	66
28	65	66	28	62	66
29	65	66	29	59	60
30	65	66	30	58	62
31	61	63	31	62	65
Total	1852	1927	Total	1951	2045

Greatest height of July, 66°.
Least ditto, ditto, 55.
Greatest height of August, 69.
Least ditto, ditto, 58.

Observations taken at Hillareden, continued.

1785.

September.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.	October.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.
1	64	66	1	62	64
2	63	67	2	62	63
3	65	68	3	59	61
4	66	68	4	59	61
5	63	65	5	59	61
6	64	65	6	53	56
7	64	65	7	50	55
8	64	65	8	60	62
9	64	66	9	55	60
10	64	66	10	56	56
11	61	65	11	51	55
12	59	64	12	57	60
13	59	62	13	60	61
14	60	65	14	62	64
15	58	60	15	59	63
16	58	61	16	59	60
17	59	64	17	57	57
18	60	64	18	57	59
19	65	66	19	59	61
20	64	67	20	60	65
21	61	65	21	57	57
22	59	62	22	48	49
23	55	62	23	45	48
24	55	58	24	57	57
25	61	63	25	52	54
26	61	63	26	48	50
27	54	60	27	57	57
28	51	56	28	57	58
29	55	57	29	49	49
30	62	63	30	47	48
			31	53	54
Total	1818	1906	Total	1726	1785

Greatest height of September, 68°.

Least ditto, ditto, 51.

Greatest height of October, 65.

Least ditto, ditto, 45.

Observations taken at Hillersdon, continued.

1795.

November.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.	December.	$\frac{1}{2}$ p. 8 a.m.	$\frac{1}{2}$ p. 9 a.m.
1	50	52	1	51	51
2	43	46	2	49	50
3	39	43	3	49	51
4	42	45	4	49	49
5	50	51	5	48	50
6	48	50	6	53	54
7	53	55	7	49	50
8	46	49	8	47	49
9	45	47	9	41	44
10	43	46	10	44	45
11	40	45	11	42	45
12	42	43	12	43	45
13	49	51	13	55	55
14	39	43	14	53	55
15	30	38	15	54	55
16	38	46	16	53	54
17	45	46	17	53	55
18	51	54	18	52	55
19	36	43	19	55	56
20	34	39	20	51	55
21	32	36	21	53	55
22	50	53	22	49	53
23	39	44	23	48	50
24	50	50	24	54	55
25	45	50	25	45	45
26	35	38	26	40	44
27	36	39	27	39	44
28	40	40	28	45	46
29	36	38	29	55	55
30	55	56	30	41	45
			31	51	52
Total	1281	1376	Total	1511	1567

Greatest height of November, 56°.
Least ditto, ditto, 30.
Greatest height of December, 56.
Least ditto, ditto, 39.

N.B. The hour of taking the Observations at Ramscomb, during November, December, and January, was half-past eight in the morning, but in Staffordshire about an hour later. The warmth of Devonshire would have appeared greater in comparison with that of Staffordshire had the same time been fixed upon for each county. The particular situation in which the thermometer was placed in Staffordshire might also tend to raise it a little above its due level.

November, 1794, at Ramscomb, the thermometer is,

one day with another, highest	3° 30'
In December, 1794, ditto, ditto, ditto	3 15
In January, 1795, ditto, ditto, ditto	7 4
In February, 1795, ditto, ditto, ditto	6 20

The observations, by each instrument, from the beginning of February, being taken at half past nine o'clock, a.m.

From some attentive, though not perfectly accurate, observations, it appears that the least allowance that can be made for the different times at which the heights of the thermometers, in Devon and Staffordshire were marked, will be 1° 30' in November and December, and 1° in January.

Thus the superiority of the Devon temperature will be

In November, one day with another, ...	5° 0'
In December, ...	4 45
In January, ...	8 4
In February, ...	6 40
In March, ...	6 45
In April, ...	10 0
In May, ...	8 12
In June, ...	9 30

No. IV.

Register of Thermometer kept at Edgbaston Hall, near Birmingham, three Observations each Day, during the whole of the Year 1795, and January, February, March, and April, of 1796.

1795.

Jan.	Nine. A. M.	Two P. M.	Nine P. M.	Feb.	Nine A. M.	Two P. M.	Nine P. M.
1	22	28	24	1	32	33	30
2	20	23	17	2	30	30	27
3	20	26	22	3	31	29	25
4	22	29	29	4	27	30	28
5	30	36	36	5	27	30	26
6	30	40	36	6	20	31	30
7	34	34	32	7	31	34	31
8	30	31	29	8	34	38	37
9	32	35	32	9	38	44	41
10	26	31	23	10	47	48	44
11	25	31	26	11	47	47	44
12	23	30	27	12	41	38	32
13	31	33	26	13	32	34	30
14	22	28	25	14	29	—	33
15	30	27	23	15	33	41	38
16	26	28	28	16	36	39	32
17	20	25	30	17	27	34	32
18	27	30	26	18	29	39	27
19	25	27	22	19	27	28	27
20	22	22	20	20	27	25	26
21	20	24	22	21	25	28	28
22	19	23	21	22	31	34	33
23	20	22	20	23	36	39	38
24	21	25	25	24	37	34	38
25	19	26	24	25	37	42	39
26	18	20	25	26	32	42	39
27	38	41	36	27	34	37	32
28	32	32	25	28	30	30	25
29	19	24	21				
30	12	24	17				
31	23	28	30				
Total	867			Total	927		

Greatest height (*by morning observation*) of January 38°—Least ditto 12°.

Greatest height of February 47 —Least ditto 20.

Observations at Edgbaston.

1795.

July	Nine A.M.	Two P.M.	Nine P.M.	August	Nine A.M.	Two P.M.	Nine P.M.
1	58	62	55	1	56	60	59
2	58	63	58	2	60	61	56
3	56	58	54	3	59	64	59
4	58	59	51	4	58	65	57
5	56	63	55	5	58	67	59
6	55	61	55	6	61	66	61
7	58	61	57	7	59	65	59
8	54	58	55	8	59	62	58
9	53	62	56	9	61	63	61
10	55	63	54	10	63	67	64
11	52	59	51	11	64	73	67
12	52	57	55	12	65	73	67
13	56	62	54	13	69	71	66
14	57	67	57	14	64	67	60
15	56	57	52	15	62	65	61
16	56	62	58	16	61	67	62
17	59	59	55	17	58	63	56
18	57	60	57	18	58	63	57
19	61	65	60	19	58	63	64
20	59	66	60	20	65	69	58
21	61	68	61	21	61	61	55
22	60	59	55	22	57	60	55
23	51	57	54	23	56	64	61
24	54	60	55	24	62	67	61
25	55	63	55	25	61	60	62
26	57	65	58	26	61	68	62
27	57	63	61	27	58	63	57
28	63	65	61	28	57	61	53
29	64	66	59	29	57	62	55
30	60	64	60	30	57	64	57
31	60	64	57	31	58	64	57
Total	1768			Total	1882		

Greatest height of July, 64°.
 Least ditto, ditto, 51.
 Greatest height of August, 69.
 Least ditto, ditto, 56.

Observations at Edgbaston.

1795.

Sept.	Nine A.M.	Two P.M.	Nine P.M.	Oct.	Nine A.M.	Two P.M.	Nine P.M.
1	57	67	61	1	55	63	61
2	60	70	62	2	59	63	55
3	61	71	64	3	55	57	55
4	64	66	61	4	54	58	53
5	64	64	62	5	52	57	53
6	62	64	62	6	50	55	46
7	62	66	65	7	45	55	50
8	64	67	61	8	51	57	52
9	61	67	57	9	52	55	49
10	57	64	61	10	48	53	47
11	61	67	58	11	45	54	48
12	58	65	57	12	47	53	51
13	59	65	58	13	57	60	53
14	62	65	60	14	58	61	57
15	54	63	55	15	55	57	53
16	54	63	55	16	58	58	55
17	57	64	59	17	55	57	51
18	59	68	62	18	56	60	53
19	63	68	64	19	56	62	58
20	60	71	61	20	59	62	55
21	59	65	56	21	56	57	49
22	54	64	58	22	47	56	49
23	58	60	51	23	45	52	49
24	54	60	56	24	55	53	52
25	62	67	59	25	52	56	48
26	62	57	49	26	49	53	47
27	47	55	47	27	50	54	55
28	49	59	48	28	56	55	48
29	51	58	59	29	45	51	48
30	60	65	60	30	45	48	45
				31	50	52	48
Total	1755			Total	1617		

Greatest height of September, 64°.
 Least ditto ditto, 47.
 Greatest height of October, 59.
 Least ditto ditto, 45.

Observations at Edgbaston.

1795.

July	Nine A.M.	Two P.M.	Nine P.M.	August	Nine A.M.	Two P.M.	Nine P.M.
1	58	62	55	1	56	60	59
2	58	63	58	2	60	61	56
3	56	58	54	3	59	64	59
4	58	59	51	4	58	65	57
5	56	63	55	5	58	67	59
6	55	61	55	6	61	66	61
7	58	61	57	7	59	65	59
8	54	58	55	8	59	62	58
9	53	62	56	9	61	63	61
10	55	63	54	10	63	67	64
11	52	59	51	11	64	73	67
12	52	57	55	12	65	73	67
13	56	62	54	13	69	71	66
14	57	67	57	14	64	67	60
15	56	57	52	15	62	65	61
16	56	62	58	16	61	67	62
17	59	59	55	17	58	63	56
18	57	60	57	18	58	63	57
19	61	65	60	19	58	63	64
20	59	66	60	20	65	69	58
21	61	68	61	21	61	61	55
22	60	59	55	22	57	60	55
23	51	57	54	23	56	64	61
24	54	60	55	24	62	67	61
25	55	63	55	25	61	60	62
26	57	65	58	26	61	68	62
27	57	63	61	27	58	63	57
28	63	65	61	28	57	61	53
29	64	66	59	29	57	62	55
30	60	64	60	30	57	64	57
31	60	64	57	31	58	64	57
Total	1768			Total	1882		

Greatest height of July, 64°.
Least ditto, ditto, 51.
Greatest height of August, 69.
Least ditto, ditto, 56.

Observations at Edgbaston.

1795.

Sept.	Nine A.M.	Two P.M.	Nine P.M.	Oct.	Nine A.M.	Two P.M.	Nine P.M.
1	57	67	61	1	55	63	61
2	60	70	62	2	59	63	55
3	61	71	64	3	55	57	55
4	64	66	61	4	54	58	53
5	64	64	62	5	52	57	53
6	62	64	62	6	50	55	46
7	62	66	65	7	45	55	50
8	64	67	61	8	51	57	52
9	61	67	57	9	52	55	49
10	57	64	61	10	48	53	47
11	61	67	58	11	45	54	48
12	58	65	57	12	47	53	51
13	59	65	58	13	57	60	53
14	62	65	60	14	58	61	57
15	54	63	55	15	55	57	53
16	54	63	55	16	58	58	55
17	57	64	59	17	55	57	51
18	59	68	62	18	56	60	53
19	63	68	64	19	56	62	58
20	60	71	61	20	59	62	55
21	59	65	56	21	56	57	49
22	54	64	58	22	47	56	49
23	58	60	51	23	45	52	49
24	54	60	56	24	55	53	52
25	62	67	59	25	52	56	48
26	62	57	49	26	49	53	47
27	47	55	47	27	50	54	55
28	49	59	48	28	56	55	48
29	51	58	59	29	45	51	48
30	60	65	60	30	45	48	45
				31	50	52	48
Total	1755			Total	1617		

Greatest height of September, 64°.
Least ditto ditto, 47.
Greatest height of October, 59.
Least ditto ditto, 45.

Observations at Edgbaston.

1793.

Nov.	Nine A.M.	Two P.M.	Nine P.M.	Dec.	Nine A.M.	Two P.M.	Nine P.M.
1	49	50	43	1	49	54	51
2	43	42	37	2	44	45	44
3	35	40	37	3	43	44	43
4	38	43	43	4	44	43	42
5	47	48	45	5	53	52	52
6	45	47	44	6	51	53	50
7	51	52	48	7	46	47	46
8	44	49	45	8	41	45	43
9	44	48	42	9	37	39	34
10	43	41	40	10	38	37	38
11	40	45	40	11	37	40	41
12	43	48	48	12	39	42	49
13	48	50	44	13	42	49	45
14	34	40	34	14	45	48	43
15	34	41	39	15	43	48	46
16	43	45	43	16	46	49	49
17	41	44	45	17	49	50	49
18	48	48	39	18	47	50	44
19	38	39	38	19	49	53	57
20	30	31	28	20	45	49	45
21	28	35	37	21	47	57	58
22	45	48	41	22	52	52	47
23	38	42	41	23	44	46	43
24	39	45	42	24	48	54	58
25	40	47	30	25	42	43	41
26	29	30	36	26	37	40	35
27	32	37	35	27	37	41	42
28	34	36	30	28	43	45	45
29	36	38	37	29	48	46	41
30	47	53	52	30	37	41	36
				31	44	48	43
Total	1204			Total	1367		

Greatest height of November, 51°.
Least ditto ditto, 28.
Greatest height of December, 53.
Least ditto ditto, 37.

Observations at Edgbaston.

1796.

Jan.	Nine A.M.	Two P.M.	Nine P.M.	Feb.	Nine A.M.	Two P.M.	Nine P.M.
1	36	42	39	1	41	43	38
2	39	43	39	2	38	40	36
3	40	43	48	3	34	40	36
4	45	47	44	4	35	42	37
5	46	47	46	5	40	43	41
6	42	45	40	6	39	40	39
7	42	48	45	7	37	40	42
8	45	46	43	8	40	44	41
9	42	43	40	9	39	42	39
10	38	43	41	10	36	40	35
11	42	46	46	11	34	41	42
12	47	47	49	12	49	48	37
13	50	55	54	13	36	38	40
14	51	53	54	14	40	43	38
15	48	54	50	15	35	41	37
16	51	53	50	16	41	48	47
17	46	50	42	17	43	45	44
18	46	52	47	18	44	47	49
19	47	52	47	19	49	52	48
20	44	49	52	20	45	50	42
21	42	54	53	21	42	49	43
22	46	50	48	22	42	43	41
23	47	49	43	23	42	46	38
24	44	46	43	24	36	43	36
25	46	47	43	25	36	41	38
26	44	47	43	26	38	41	38
27	39	45	43	27	38	41	33
28	42	42	38	28	30	35	33
29	42	43	40	29	34	34	27
30	44	47	43				
31	40	44	39				
Total	1363			Total	1143		

Greatest height of January, 51°.
 Least ditto ditto, 36.
 Greatest height of February, 49.
 Least ditto ditto, 30.

Observations at Edgbaston.

1796.

March	Nine A.M.	Two P.M.	Nine P.M.	April	Nine A.M.	Two P.M.	Nine P.M.
1	32	37	34	1	50	55	51
2	35	37	32	2	53	57	52
3	32	33	31	3	52	58	52
4	27	34	30	4	52	55	51
5	32	36	32	5	48	51	44
6	32	35	25	6	42	51	41
7	28	33	31	7	42	49	43
8	31	32	32	8	40	50	41
9	34	36	34	9	42	44	41
10	34	37	36	10	42	46	43
11	34	41	37	11	42	45	43
12	41	47	44	12	44	46	43
13	44	49	43	13	43	48	43
14	43	51	46	14	46	51	44
15	46	54	47	15	50	54	49
16	46	51	44	16	51	55	49
17	41	54	44	17	53	58	50
18	38	50	43	18	53	59	54
19	40	52	41	19	52	61	54
20	41	44	43	20	52	60	50
21	42	48	39	21	55	66	56
22	42	48	39	22	55	64	57
23	42	47	41	23	58	63	55
24	40	44	42	24	50	55	46
25	33	40	42	25	48	57	45
26	48	51	43	26	47	54	47
27	30	37	31	27	51	57	50
28	34	40	33	28	52	60	50
29	37	42	37	29	50	55	48
30	43	47	43	30	50	53	47
31	45	51	48				
Total	1167			Total	1475		

Greatest height of March, 48°.
 Least ditto ditto, 28.
 Greatest height of April, 58.
 Least ditto ditto, 40.

No. V.

Register of Thermometer and Weather, kept at Pitt-
Place, on the Southern side of the Isle of Wight,
from November 3, 1796, to February 18, 1797. By
the Rev. Henry Jackson Close.*

* The Thermometer was placed outside of a north window, some inches
from the glass.

Observations in the Isle of Wight.

1796.

Nov.	Nine A.M.	Two P.M.	Nine P.M.	Weather.
3	—	54	50	A delightful day, very warm in the valley.
4	51	48	42	A delightful morning, a storm of rain at noon, then fin
5	44	46	39	A fine clear day, but cold.
6	43	48	49	Ditto, cloudy at night.
7	47	48	43	A delightful bright day.
8	39	47	41	Bright and pleasant, slight frost.
9	43	46	46	Cloudy and showery a.m. clear noon.
10	44	47	39	Fine day.
11	41	46	41	Ditto.
12	43	46	41	Ditto.
13	41	42	39	Ditto.
14	37	40	38	A cold, dull, but dry day.
15	38	42	38	Cloudy, dark a.m. bright p.m.
16	48	46	49	Storm of wind and rain.
17	42	42	38	Wind and clouds a.m. dry wind p.m.
18	37	42	42	White frost, shower, and then bright.
19	39	42	38	Fine day.
20	37	41	37	Very fine, rather cold.
21	35	42	44	White frost, bright a.m. rainy night.
22	42	48	43	Very fine day.
23	46	48	45	Bright, warm, and pleasant.
24	44	46	45	Gray winter day.
25	43	42	42	Gray dry day.
26	40	40	41	Wind high, gray, cold, and dry day.
27	41	44	43	Calm, dry, gray day.
28	40	43	36	Very fine day.
29	32	39	36	Calm, bright, a little frost.
30	29	31	25	A fine bright frost.
Tot.	1106			

Greatest height (by morning observation) of November, 51°.
Least ditto, ditto, ditto, 29.

Observations in the Isle of Wight.

1796.

Dec.	Nine A.M.	Two P.M.	Nine P.M.	Weather.
1	24	31	27	Bright frost.
2	24	31	28	Very pleasant.
3	38	40	41	Windy, fine dry day.
4	35	35	30	Heavy rain in night, dry frost.
5	35	41	37	Clear, pleasant, frost.
6	30	35	32	Bright sun and frost.
7	35	40	40	Fine clear day.
8	34	33	28	Ditto ditto frost.
9	27	36	30	Ditto.
10	27	33	32	Ditto.
11	39	39	34	Some rain.
12	35	38	37	A thaw, not unpleasant.
13	37	37	35	Fine thaw, and dry.
14	36	40	38	A dull day, misty rain.
15	36	38	35	A dry thaw.
16	35	36	32	Ditto.
17	30	32	32	Rain.
18	42	44	46	Rain nearly all day.
19	46	48	46	Rain morning and night.
20	44	41	34	Rain.
21	33	36	35	Fine frost.
22	31	35	31	Ditto.
23	30	31	28	Snow all night and day.
24	21	25	20	Clear frost.
25	22	29	32	Frosty morning, cloudy evening.
26	30	30	30	Dull windy day, snow deeply drifted.
27	27	29	32	Cold windy day.
28	43	45	46	Rain all night, fine mild day.
29	43	47	45	Warm and dull shower at noon.
30	46	48	47	Rain in night, showery day.
31	45	48	46	Misty driving rain.
Tot.	1060			

Greatest height of December, 46°.

Least ditto ditto 21.

F f 2

Observations in the Isle of Wight.

1797.

Jan.	Nine A.M.	Two P.M.	Nine P.M.	Weather.
1	45	46	45	Gray day, but dry.
2	44	44	42	Misty, showers at times.
3	41	42	40	Fogs, but no rain.
4	40	40	40	Gray, dry day.
5	38	38	37	Fine gray day.
6	34	32	32	Dry, gray, and cold.
7	32	32	31	Frosty on the hills.
8	31	30	29	Gray, and rather frosty.
9	28	26	25	Dull day, frosty.
10	32	33	31	Ditto.
11	28	32	35	Frost a.m. snow, rainy night.
12	31	32	32	Snow and sleet all day, rainy night.
13	36	40	46	Frost in the night, thaw and rain.
14	45	46	46	Driving rain, dark day.
15	36	37	35	Rain all night and all day.
16	34	32	34	Bright day, frost on the hills.
17	34	38	39	Frost in the night, fine day, thaw.
18	38	41	45	Misty rain all day.
19	41	44	44	Ditto.
20	44	46	44	Ditto.
21	44	46	45	Misty day.
22	42	44	44	Foggy.
23	43	42	42	Gray, wind and fog on the hill.
24	44	43	39	Foggy.
25	38	—	37	Clear calm day, bright frost.
26	39	44	38	Ditto.
27	41	46	46	Fine a.m. clouds and rain at night.
28	44	41	40	Stormy night, showers and sunshine.
29	43	46	42	Rain a.m. fine p.m.
30	44	48	45	Clouds and showers, a tolerable day.
31	46	44	41	Rain all night, stormy day.
Tot.	1200			

Greatest height of January, 46°.

Least ditto ditto, 28.

Observations in the Isle of Wight.

1797.

Feb.	Nine A.M.	Two P.M.	Nine P.M.	Weather.
1	45	46	45	Dull and moist, fine evening.
2	45	47	45	Fog all day.
3	46	46	40	Gray day.
4	38	38	37	Close and foggy.
5	37	37	38	Dull and moist p.m.
6	37	37	36	Ditto and cold.
7	36	36	35	Gray day, thick on the hills.
8	34	37	37	Ditto.
9	38	39	37	Fine gray day.
10	35	37	34	Ditto.
11	37	45	41	Gray a.m. sunny p.m.
12	45	48	44	Foggy a.m. fine p.m.
13	42	45	43	Rain a.m. fine p.m.
14	40	40	35	Fine a.m. storms and sun p.m.
15	34	36	32	Fine frost.
16	33	41	34	Ditto, very pleasant.
17	38	41	37	Mild at Pitt-Place, frost on the hills.
18	42	—	—	

Greatest height between the 1st and 18th of February, 46°.
Least ditto ditto ditto, 33.

No. VI.

*Register of Thermometer, and Rain-Gage, kept at
Hordle, Hants, from January 27 to July 25, 1798,
inclusive. By the Rev. Henry Jackson Close.*

The Rain-Gage (ten inches square) was put down February 3,
1798.

			Cubic Inches.
Feb.	25	.....	100
April	5	.....	180
	17	.....	60
	21	.....	50
May	18	.....	110
June	23	.....	20
July	5	.....	220
	12	.....	60
	17	.....	100
	21	.....	140
	25	.....	60

THERMOMETRICAL REGISTER.

1798.

Jan.	Morning.	Noon.	Night.
27	—	—	35
28	31	42	40
29	42	45	41
30	41	45	47
31	46	47	42

Observations at Hordle.

1798.

Feb.	Morning.	Noon.	Night.	March.	Morning.	Noon.	Night.
1	43	46	44	1	36	49	40
2	48	50	47	2	47	50	46
3	48	48	47	3	49	52	47
4	—	47	39	4	49	49	46
5	39	41	32	5	48	52	46
6	33	43	33	6	50	50	47
7	33	43	35	7	50	53	46
8	34	46	43	8	50	53	41
9	35	47	35	9	48	54	42
10	45	46	45	10	49	53	47
11	45	49	46	11	38	41	33
12	44	46	43	12	37	44	35
13	46	48	44	13	40	43	34
14	47	47	48	14	39	50	35
15	49	49	46	15	47	52	46
16	37	44	33	16	47	50	37
17	34	32	32	17	45	50	36
18	30	39	27	18	41	45	36
19	28	35	31	19	39	44	36
20	38	41	36	20	35	46	33
21	35	43	39	21	48	48	35
22	41	46	39	22	36	46	32
23	45	47	48	23	39	41	38
24	48	46	43	24	39	42	38
25	46	47	42	25	43	47	37
26	43	48	35	26	44	49	44
27	38	38	35	27	42	45	40
28	38	46	34	28	44	51	43
				29	46	49	41
				30	45	41	39
				31	31	38	34
Total	1138			Total	1289		

Greatest height of February, 49°.
Least ditto ditto, 28.
Greatest height of March, 50.
Least ditto ditto, 31.

Observations at Hordle.

1798.

April.	Morning.	Noon.	Night.	May.	Morning.	Noon.	Night.
1	41	—	41	1	53	60	44
2	45	51	44	2	54	59	40
3	49	51	47	3	56	59	49
4	49	53	47	4	55	59	48
5	51	56	48	5	52	57	50
6	52	54	47	6	57	62	51
7	52	54	48	7	50	53	48
8	55	58	44	8	55	59	48
9	54	64	52	9	55	64	50
10	57	64	54	10	58	58	51
11	56	58	50	11	56	55	51
12	53	58	49	12	56	56	51
13	56	59	50	13	57	57	50
14	49	56	47	14	51	56	52
15	53	55	48	15	55	64	51
16	52	55	49	16	56	60	54
17	56	63	47	17	55	58	51
18	49	53	48	18	58	59	51
19	51	51	41	19	58	61	53
20	42	46	40	20	59	63	51
21	51	53	51	21	58	64	52
22	51	59	50	22	59	61	51
23	59	67	50	23	57	63	48
24	55	61	45	24	59	61	52
25	56	61	46	25	62	64	56
26	59	61	49	26	64	66	59
27	60	69	56	27	66	76	63
28	57	60	50	28	66	74	59
29	55	63	48	29	58	61	55
30	59	67	50	30	59	68	58
				31	60	60	59
Total	1584			Total	1774		

Greatest height of April, 60°.
Least ditto ditto, 41.
Greatest height of May, 66.
Least ditto ditto, 51.

Observations at Hordle.

1798.

June.	Morning.	Noon.	Night.	July.	Morning.	Noon.	Night.
1	60	60	55	1	61	74	59
2	57	66	52	2	63	65	58
3	61	—	56	3	63	—	61
4	59	66	55	4	67	67	61
5	—	—	—	5	64	64	60
6	66	73	63	6	—	65	59
7	74	83	68	7	65	67	59
8	62	72	58	8	65	—	56
9	62	67	56	9	64	68	60
10	62	69	55	10	62	65	62
11	61	69	55	11	—	66	55
12	62	65	56	12	—	67	55
13	61	70	59	13	62	66	53
14	68	72	59	14	62	—	56
15	68	76	59	15	62	66	58
16	66	—	60	16	61	64	53
17	69	74	64	17	60	69	56
18	67	68	59	18	62	66	—
19	64	65	53	19	63	64	61
20	60	—	55	20	64	—	59
21	60	60	51	21	61	—	57
22	63	65	55	22	61	63	57
23	63	60	55	23	61	63	61
24	62	68	59	24	64	62	57
25	65	66	59	25	61	65	58
26	67	66	59				
27	69	71	60				
28	72	72	61				
29	67	68	59				
30	65	67	60				
Total	1922			Total	1566		

Greatest height of June,	74°.
Least ditto ditto,	57.
Greatest height of July,	67.
Least ditto ditto,	60.

No. VII.

*Register of Rain-Gage at Penzance, Cornwall, from
September 21, 1798, to March 20, 1799. By the
Rev. J. Thomas Thomson.*

1798.

September.	October.	November.	December.
Days. Depth.	Days. Depth.	Days. Depth.	Days. Depth.
21.... 6	2.... 5	1.... 3	1....27
23.... 3	3.... 2	2....31	2....28
25.... 3	5.... 8	3.... 2	3....15
26....70	9....16	4....32	4....63
27....52	10....26	5.... 8	5....21
28.... 6	14....17	6....36	13.... 4
29....11	15.... 5	7....29	14....25
30....14	16.... 8	8....30	15....42
	18....15	9....10	16....29
	19.... 7	10....26	17.... 9
	20.... 3	11....19	18....11
	21....36	12....30	24.... 2
	22.... 2	13....24	
	24.... 6	16.... 5	
	25....23	18....25	
	26....53	20....17	
	27....13	21....32	
	28.... 2	25....20	
	29....35	26....41	
	30....10	27....38	
	31....23	28....10	
		29.... 8	
		30.... 6	
Total 165	Total 315	Total 482	Total 276

Rain-Gage at Penzance.
1799.

January.	February.	March.
Days. Depth.	Days. Depth.	Days. Depth.
7.....10	1....60	7.... 8
9..... 8	7.... 9	8....24
10..... 7	8....17	9....10
12.....12	10....30	13....10
13..... 3	11....17	17....10
16.....20	12....15	19....50
17... ..21	13....30	20.... 9
19.....12	14....10	
20.....16	15....15	
21..... 5	16....12	
22.....40	17....20	
24.....22	18....20	
26.....21	19....12	
27.....17	20....40	
28.....19	21....22	
29..... 7	27....12	
30.....49	28.... 5	
31.....64		
Total 353	Total 346	Total 121

No. VIII.

Meteorological Observations made at Lisbon, from 1777 to 1787. By Major Prætorius, Member of the Royal Academy of Sciences, &c.

1777.

Quantity of Rain in French Inches.

Inches.	Lines.	Greatest Heat.	Least.	Mean Heat.	Greatest difference in One Day.
22	10	97	30	63	37

1778.

23	6	94	34	63	27
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1779.

20	2	96	35	63	31
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1780.

23	2	104	34	63	34
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1781.

23	7	99	34	63	28
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1783.

Rain 27 inches.

Regular fall on an average of several years only 23 inches.

1784.

Rain $33\frac{1}{2}$ inches.

Clear.....3764 hours, or 157 days.

Flying clouds 3169 132 ditto.

Quite cloudy 1851 77 ditto.

Observations at Lisbon.

1784.

Mean degree by Fahrenheit's Thermometer.

January 54	February 55	March 57
April 57	May 67	June 70
July 73	August 73	Sept. 71
Oct. 60	Nov. 54	Dec. 51

Hence the mean temperature of the year 62° .

June 15th, the thermometer indicated 97° ; July 13th, 102° ;
 July 16th, 99° ; August 13th, for two hours in the evening,
 106° ; August 14th, 103° .

Greatest cold, December 4th, in the morning, (freezing) 30° .Barometer highest, 23d April, viz. 28 inches, $7\frac{1}{2}$ lines.

Lowest, 27th December, viz. 27 inches, 5 lines.

Mean, 28 inches, 2 lines, close to the sea.

1785.

Mean temperature $62^{\circ}\frac{16}{100}$

Greatest heat, 11th June... 94.

Least heat, 3d March 36.

Highest barometer (French) inches 28, lines 6.

27, lines 6.

January 9th.

1787.

Rained 115 days.

Fair 250 ditto.

Mean height of barometer, 28 inches, 2 lines.

Greatest height, Feb. 1, inches 28, lines $7\frac{1}{2}$.Least height, January 12th, inches 27, lines $4\frac{1}{2}$.Mean temperature $62^{\circ}\frac{8}{100}$.

Observations at Lisbon.

Greatest heat, 2d and 16th August in the evening, 97°.

Greatest cold, 4th and 7th January, (freezing) 31°.

Barometer generally highest at the end of December, when with the new moon and N.E. wind it is often 28 inches and 9 lines.

The highest parts of Lisbon are two degrees cooler than the lower parts.

The Tagus, opposite Belem, in December, at a depth of thirty yards, indicated 64°.

Temperature of springs at Lisbon, summer and winter, 67°.

for

Year 1791.	State of the sky, with the proportion of time, reckoned in hours.			Rain as
Months.	Clear & serene sky, or light and high clouds.	Heavy, dark, and lowering clouds.	The sky entirely overcast with clouds.	Quantity of rain, in French inches, and lines. quak and ps.
January	204	224	316	I. L. 2 3
Feb.	366	184	122	0 7½
March	489	180	75	0 2½

No. X.

Register of the Weather, kept at St. Jozè de Riba Mer, Six miles West of Lisbon, near the banks of the Tagus, from December 20, 1792, to March 16, 1793, and at Braço de Prata, a few miles Eastward of the City, and also near the River, from that date to the 10th of May following, inclusive; compared with the corresponding Temperatures in London, during the same period, from the Observations of Mr. Cary, in the Strand.

N.B. The Barometer stood 44 yards above the level of the sea. The Thermometer bulb was about $\frac{3}{16}$ of an inch diameter. It hung on the outside of the house, in a N.E. aspect; as not in contact with any wall or other solid mass of matter, and the sun never shone upon it.

The observations were usually made at 7 in the morning and at 9 at night.

The Hygrometer was a piece of catgut hanging vertically, supporting an horizontal index.

Observations at St. Joze de Riba Mer, near Lisbon, compared with London.

1792.

Month & Day.	D's Age.	Wind.	Barometer.		Thermo- meter.		Hygrometer.	Weather.		Miscellaneous Observa- tions.
			Morn.	Even.	Mn.	Ev		Morn.	Even.	
Dec.							Stationary about the Medium point.			
20	7	—	30 50	30 50	42	50		clear	clear	
21	8	—	30 60	30 50	50	50		clear	clear	Therm. at noon 58°, high wind all day. All this week at 2 o'clock the Therm. was nearly at 60°.
22	9	—	30 50	30 40	48	50		cloud.	clear	
23	10	—	30 40	30 30	52	50		cloud.	rain	
24	11	—	30 30	30 20	50	52		cloud.	clear	
25	12	NE by E	30 15	30 10	52	50		cloud.	clear	
26	13	NW	30 10	30 10	50	50		clear	clear	
27	14	NW	30 20	30 20	46	50		cloud.	clear	
28	15	NE by E	30 30	30 34	50	50		clear	clear	
29	16	NW	30 40	30 40	50	50		cloud.	clear	
30	17	ENE	30 47	30 31	50	52		cloud.	cloud.	
31	18	N by E	30 31	30 40	51½	54		cloud.	rain	Rained from 1 to 3 p.m. Therm. at 59°. Wind WSW.
			Total		591					

Greatest height of the twelve days of December, 1792,
by morning observation, near Lisbon 52°.
Least ditto 42.

1792.

*Corresponding Temperature in London, during the same
Period, from the Observations of Mr. Cary, in the Strand.*

Dec.	Thermometer, 8 A.M.
20.....	45°.
21.....	37.
22.....	44.
23.....	33.
24.....	31.
25.....	29.
26.....	32.
27.....	33.
28.....	34.
29.....	36.
30.....	43.
31.....	29.

Total 426

Greatest height of the twelve days of December, 1792, by morning
observation in London..... 45°.
Least ditto 29.

Observations near Lisbon

1793.

January.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.	Weather.		Miscellaneous Observations.	
			Morn.	Even.	Morn.	Ev.		Morn.	Even.		
1	19	N by E	30	23	36	23	32	30	cloudy.	clear.	
2	20	NNE	30	35	30	23	49	51	ditto.	rain.	
3	21	sw by w	30	23	30	25	52	52	ditto.	cloudy.	
4	22	N by w	30	40	50	45	50	50	clear.	clear.	A great fog at 1
5	23	S by E	30	50	30	40	48	52	cloudy.	cloudy.	none here.
6	24	SE by S	30	54	30	50	52	48	clear.	clear.	
7	25	E by S	30	57	30	50	42	47	ditto.	ditto.	
8	26	NE	30	62	30	46	40	46	ditto.	ditto.	
9	27	—	30	50	30	42	45	48	dryish	ditto.	
10	28	SE by E	30	42	30	40	47	51	dry med.	ditto.	
11	29	SE by S	30	51	30	39	48	54	dryish	clear.	
12	1	w	30	30	30	22	56	52	m. moist	cloudy.	Rain from 10½ A
13	2	w	30	20	30	—	56	54	moist	ditto.	even. Hygr. 8
14	3	w	30	20	30	13	54	49	very wet	ditto.	Barom. 30 19.
15	4	N by w	30	25	30	25	46	47	moist	clear.	S.W. by W.
16	5	N by E	30	30	30	27	44	46	dry	rain.	Gentle rain from 9
17	6	NW	30	27	30	29	44	42	dry	clear.	some hours.
18	7	w	30	26	30	20	44	42	very dry	ditto.	Rain from 8
19	8	N by E	30	35	30	35	38	42	ditto.	ditto.	A.M.
20	9	E	30	20	30	40	38	50	dryish	cloudy.	
21	10	E	30	38	30	39	45	48	very dry	ditto.	
22	11	E	30	40	30	42	48	51	dry	ditto.	
23	12	—	30	50	—	—	50	—	medium	ditto.	
24	13	E	—	—	—	—	52	—	dryish	cloudy.	
25	14	NE	30	44	30	44	52	52	—	—	
26	15	NE	30	44	30	38	52	51	—	—	
27	16	N	30	40	30	38	50	50	dryish	clear.	Two o'clock, v
28	17	NE	30	50	30	40	46	48	dry	clear.	Rain at 4.
29	18	E	30	33	30	34	42	48	ditto.	ditto.	
30	19	N	30	38	30	36	46	48	dry	ditto.	Noon, wind S.
31	20	NE	30	42	30	24	46	48	dryish	ditto.	S.W.
			Total		1424						

Greatest height of January 56°.

Least ditto 38.

451

compared with London.

1793.

Jan. Thermometer, 8 A.M.

1.....	34°.
2.....	34.
3.....	27.
4.....	31.
5.....	35.
6.....	32.
7.....	31.
8.....	46.
9.....	31.
10.....	41.
11.....	43.
12.....	39.
13.....	35.
14.....	35.
15.....	34.
16.....	33.
17.....	33.
18.....	32.
19.....	25.
20.....	32.
21.....	31.
22.....	35.
23.....	33.
24.....	37.
25.....	37.
26.....	30.
27.....	32.
28.....	38.
29.....	45.
30.....	38.
31.....	36.

Total..1080

Greatest height of January 46°.

Least ditto 25.

1798

Observations near Lisbon

1798.

May.	Moon's Age.	Wind.	Barometer.		Thermo- meter.		Hygrometer.	Weather.		Miscellaneous Observations.
			Morn.	Even.	Morn.	Ev.		Morn.	Even.	
2 23		NW	—	30 29	—	50	— D.1.	clear.	clear.	
3 24		N	30 03	—	54	—	—	ditto.	ditto.	
4 25		N	30 26	30 02	60	58	D9. D13	ditto.	ditto.	
5 26		N	30 26	—	62	—	D.13. —	ditto.	ditto.	
6 27		—	—	30 25	—	60	— D.5.	ditto.	ditto.	
7 28		NE	30 12	—	61	—	D.3. —	ditto.	ditto.	
8 29		NE	—	30 —	—	57	— D.7.	ditto.	ditto.	
9 30		N	30 01	30 14	62	55	D5. D6.	ditto.	ditto.	
10 1		NW	30 17	30 17	62	54	D6. D7.	ditto.	ditto.	

compared with London.

1798.

May.	Thermometer, 8 A.M.
1.....	48°.
2.....	46.
3.....	44.
4.....	46.
5.....	45.
6.....	44.
7.....	45.
8.....	43.
9.....	46.
10.....	44.
Total. .452	

Greatest height of 10 days in May .. .48°.
Least ditto 43.

453

compared with London.

1798.

Feb.	Thermometer, 8 A.M.
1.....	41°.
2.....	33.
3.....	41.
4.....	38.
5.....	33.
6.....	36.
7.....	33.
8.....	36.
9.....	36.
10.....	34.
11.....	36.
12.....	38.
13.....	39.
14.....	45.
15.....	36.
16.....	34.
17.....	33.
18.....	36.
19.....	31.
20.....	32.
21.....	32.
22.....	28.
23.....	42.
24.....	48.
25.....	47.
26.....	39.
27.....	40.
28.....	40.

Total..1039

Greatest height of February 48°.

Least ditto.....28.

Observations near Lisbon

1793.

June.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Observations
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1	23	N	30 25	30 12	60	55	D.3	D.5	clear.	cloudy.	2 P.M. wind W. Barometer began to fall. Rain all day. Wind changed towards night to N.W. by W.
2	24	w by s	30 07	30 06	59	61	D.2	W.7	rain.	rain.	
3	25	sw by w	30 13	30 12	61	58	W.5	D.4	cloudy.	clear.	
4	26	NW	30 16	30 2	61	58	D.4	D.3	clear.	ditto.	
5	27	N	30 13	30 1	65	61	med.	D.3	ditto.	ditto.	At 2 P.M. Ther. 84; at 4, 86 in the shade.
6	28	N	30 07	30 —	68	67	D.2	W.3	ditto.	cloudy.	
7	29	N	30 03	30 05	65	58	D.3	D.6	ditto.	clear.	
8	1	N	30 04	—	68	—	D.5	—	ditto.	—	
9	2	—	—	30 —	—	67	—	D.11	—	clear.	At 2 P.M. Ther. 84; at 4, 86 in the shade.
10	3	N	30 —	29 —	66	65	D.7	D.3	clear.	ditto.	
11	4	w by s	29 92	29 97	66	61	D.3	D.3	ditto.	ditto.	
12	5	ws w	30 13	30 06	64	59	D.3	D.4	cloudy.	cloudy.	
13	6	—	—	30 04	—	58	—	—	—	clear.	Rain began at noon, and continued gently during remainder of the day.
14	7	—	—	29 97	—	60	—	D.8	—	ditto.	
15	8	N	—	30 —	—	59	—	D.8	—	—	
16	9	—	—	30 —	—	67	—	D.11	—	clear.	
17	10	n by w	—	29 9	—	72	—	D.11	—	cloudy.	Thermometer at 2 P.M. 87.
18	11	N	29 89	29 7	70	71	D.6	D.14	clear.	ditto.	
19	12	NW	29 72	29 8	70	68	D.5	D.2	cloudy.	ditto.	
20	13	w	29 93	30 05	67	61	D.3	D.6	ditto.	ditto.	
21	14	w	30 —	30 1	64	63	D.5	D.5	ditto.	ditto.	Thermometer at 2 P.M. 87.
22	15	n by w	30 08	30 13	65	56	D.6	D.7	ditto.	clear.	
23	16	—	—	30 03	—	59	—	D.6	—	cloudy.	
24	17	n by w	30 07	30 —	64	65	D.2	D.6	cloudy.	clear.	
25	18	N	30 05	29 98	68	70	D.5	D.9	clear.	ditto.	Thermometer at 2 P.M. 87.
26	19	NW	29 99	29 9	70	65	D.7	D.9	ditto.	ditto.	
27	20	NW	29 9	29 6	67	64	D.6	D.2	ditto.	cloudy.	
28	21	N	30 03	30 08	67	60	D.2	med.	cloudy.	clear.	
29	22	N	31 —	30 06	67	64	D.1	W.7.	clear.	ditto.	
30	23	N	—	30 1	—	65	—	D.5	—	ditto.	

compared with London.

1793.

March.	Thermometer, 8 A.M.
1.....	40°
2.....	40.
3.....	40.
4.....	33.
5.....	32.
6.....	39.
7.....	38.
8.....	37.
9.....	35.
10.....	34.
11.....	35.
12.....	33.
13.....	44.
14.....	48.
15.....	34.
16.....	42.
17.....	34.
18.....	42.
19.....	36.
20.....	48.
21.....	47.
22.....	40.
23.....	37.
24.....	34.
25.....	35.
26.....	35.
27.....	38.
28.....	31.
29.....	30.
30.....	31.
31.....	32.
Total. 1234	

Greatest height of March.....41°.

Least ditto 31.

Observations near Lieben

1773.

July.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Observations
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1 24	N		29 98	29 98	69	66	D.7	D.5	clear.	clear.	
2 25	N		—	—	—	—	—	—	—	—	
3 26	N		29 94	30 04	68	69	D.9	D.6	clear.	clear.	
4 27			—	29 96	—	70	—	D.11	—	ditto	At 2 P.M. Ther. 90°.
5 28	NW		—	29 86	—	76	—	D.12	—	cloudy.	At 2 P.M. Ther. 91°.
6 29	W		—	29 93	—	66	—	D.8	—	ditto.	
7 30	N		—	29 98	—	63	—	D.6	—	clear.	
8 1	NW		—	29 96	—	68	—	D.3	—	cloudy.	
9 2	N		29 99	29 9	69	66	D.2	D.3	cloudy.	ditto.	
10 3	NE		29 99	29 94	68	68	D.2	—	ditto.	ditto.	Rain all A.M. lighting at night.
11 4	NE		30 02	30 04	67	64	D.4	D.4	ditto.	rain.	
12 5	N		30 05	30 05	65	60	D.7	D.8	ditto.	clear.	
13 6	N		30 08	30 02	65	59	D.9	D.6	clear.	ditto.	
14 7	W		—	29 —	—	60	—	D.7	—	ditto.	
15 8	W		29 —	29 93	67	61	D.5	D.5	clear.	ditto.	
16 9	SW		29 93	29 95	66	65	D.5	—	cloudy.	cloudy.	
17 10	W		29 97	30 05	65	62	D.5	—	ditto.	clear.	
18 11	—		—	30 15	—	63	—	D.5	—	cloudy.	
19 12	N		30 12	30 1	69	64	D.4	D.3	cloudy.	ditto.	
20 13	N		30 05	30 —	65	65	D.3	D.8	clear.	clear.	
21 14	—		—	29 83	—	73	—	D.12	—	ditto.	
22 15	N		29 86	29 83	73	75	D.13	D.15	clear.	ditto.	At 2 P.M. Ther. 93°.
23 16	NE		29 83	29 8	74	79	D.12	D.16	ditto.	ditto.	Ditto. 95°.
24 17	N		29 8	29 8	78	77	D.16	D.12	ditto.	ditto.	
25 18	W		—	29 87	74	66	D.7	D.7	ditto.	ditto.	} Very windy, particularly at night.
26 19	N		29 87	29 93	69	66	D.7	D.4	ditto.	ditto.	
27 20	N		29 92	29 91	70	69	D.7	D.2	ditto.	cloudy.	
28 21	NW		—	29 86	—	63	—	D.7	—	clear.	
29 22	NW		29 7	29 7	68	67	D.7	D.9	clear.	ditto.	
30 23	—		—	—	—	—	—	—	—	—	
31 24	NW		29 93	29 94	67	64	D.7	D.5	clear.	clear.	

compared with London.

1798.

April.	Thermometer, 8 A.M.
1.....	37°.
2.....	33.
3.....	34.
4.....	36.
5.....	40.
6.....	38.
7.....	35.
8.....	38.
9.....	35.
10.....	35.
11.....	35.
12.....	37.
13.....	35.
14.....	42.
15.....	31.
16.....	33.
17.....	32.
18.....	45.
19.....	37.
20.....	33.
21.....	40.
22.....	36.
23.....	44.
24.....	44.
25.....	44.
26.....	43.
27.....	43.
28.....	42.
29.....	44.
30.....	47.
Total..1158	

Greatest height of April.....47°.

Least ditto 31.

Observations near Lisbon

1793.

August.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Observations
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1 25		N	29 87	29 82	68	70	D.6	D.10	clear.	clear.	
2 26		N	29 82	29 78	70	63	D.7	D.8	ditto.	ditto.	
3 27		N	29 84	29 78	68	62	D.8	D.8	ditto.	ditto.	
5 29	N by E		29 8	29 92	68	66	D.7	D.7	ditto.	ditto.	
6 1		—	29 93	29 93	66	66	D.3	D.8	ditto.	ditto.	
7 2		—	29 93	29 93	66	66	D.3	D.5	ditto.	ditto.	
8 3		—	29 9	29 9	—	67	D.8	D.7	ditto.	ditto.	
9 4		—	29 88	29 82	72	64	D.7	D.11	ditto.	ditto.	
10 5		—	29 79	29 76	73	76	D.11	—	ditto.	ditto.	P.M. Ther. 97°.
11 6		—	29 76	29 76	—	72	D.8	D.15	ditto.	ditto.	
12 7	W by N		29 86	29 88	72	66	D.8	—	ditto.	ditto.	
13 8	W		—	30 04	68	67	D.7	D.5	cloudy.	—	
14 9	N		30 —	29 98	69	70	D.6	D.5	clear.	cloudy.	In evening, wind W.
15 10	W		29 98	29 99	70	62	D.5	D.6	cloudy.	ditto.	Gentle rain all morn.
16 11	N		29 98	29 98	69	62	D.10	D.7	clear.	clear.	
17 12	W		29 99	30 02	68	68	med.	med.	cloudy.	cloudy.	
19 14	—		—	29 9	—	66	—	D.2	—	ditto.	Ditto. morn. & even.
20 15	WNW		29 9	29 96	66	64	—	D.4	cloudy.	clear.	
21 16	N by E		29 97	29 88	69	75	D.10	D.13	clear.	ditto.	
22 17	N by E		29 88	29 76	73	75	D.10	D.1	ditto.	cloudy.	About 2 P.M. violent thunder with rain, wind veered in an instant to W.
23 18	N by E		29 82	29 73	73	71	D.4	D.8	cloudy.	clear.	In evening, wind W.
24 19	NW		29 73	29 7	70	69	D.1	D.4	ditto.	cloudy.	Violent rain from 10 to 11 A.M.
26 21	W		—	29 82	—	66	—	D.4	ditto.	clear.	
27 22	W		—	29 92	—	64	—	D.6	—	ditto.	
28 23	N		29 93	30 —	69	63	D.4	D.6	clear.	ditto.	
29 24	N		30 —	30 02	66	64	D.5	D.6	cloudy.	cloudy.	
30 25	N		30 —	30 —	66	67	D.5	D.4	ditto.	clear.	
31 26	N by E		30 —	29 94	66	68	D.6	D.8	clear.	ditto.	

compared with London.

1793.

August.	Thermometer, 8 A.M.
1.....	58°.
2.....	60.
3.....	64.
4.....	60.
5.....	59.
6.....	60.
7.....	57.
8.....	60.
9.....	59.
10.....	61.
11.....	55.
12.....	57.
13.....	64.
14.....	56.
15.....	58.
16.....	58.
17.....	56.
18.....	53.
19.....	53.
20.....	52.
21.....	56.
22.....	58.
23.....	58.
24.....	54.
25.....	50.
26.....	51.
27.....	53.
28.....	57.
29.....	56.
30.....	57.
31.....	53.
Total..1766	

Greatest height of August.....64°.
Least ditto 51.

Observations near Lisbon

1793.

August.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Observations
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1 25		N	29 37	29 82	68	70	D.6	D.10	clear.	clear.	
2 26		N	29 82	29 78	70	63	D.7	D.8	ditto.	ditto.	
3 27		N	29 84	29 78	68	62	D.8	D.8	ditto.	ditto.	
5 29		N by E	29 8	29 92	68	66	D.7	D.7	ditto.	ditto.	
6 1		—	29 93	29 93	66	66	D.3	D.8	ditto.	ditto.	
7 2		—	29 93	29 93	66	66	D.3	D.5	ditto.	ditto.	
8 3		—	29 9	29 9	—	67	D.8	D.7	ditto.	ditto.	
9 4		—	29 88	29 82	72	64	D.7	D.11	ditto.	ditto.	
10 5		—	29 79	29 76	73	76	D.11	—	ditto.	ditto.	P.M. Ther. 97.
11 6		—	29 76	29 76	—	72	D.8	D.15	ditto.	ditto.	
12 7		W by N	29 86	29 88	72	66	D.8	—	ditto.	ditto.	
13 8		W	—	30 04	68	67	D.7	D.5	cloudy.	—	
14 9		N	30 —	29 98	69	70	D.6	D.5	clear.	cloudy.	In evening, wind W.
15 10		W	29 98	29 99	70	62	D.5	D.6	cloudy.	ditto.	Gentle rain all morn.
16 11		N	29 98	29 98	69	62	D.10	D.7	clear.	clear.	
17 12		W	29 99	30 02	68	68	med.	med.	cloudy.	cloudy.	
19 14		—	—	29 9	—	66	—	D.2	—	ditto.	Ditto. morn. & even.
20 15		WNW	29 9	29 96	66	64	—	D.4	cloudy.	clear.	
21 16		N by E	29 97	29 88	69	75	D.10	D.13	clear.	ditto.	
22 17		N by E	29 88	29 76	73	75	D.10	D.1	ditto.	cloudy.	About 2 P.M. violent thunder with rain, wind veered in an instant to W.
23 18		N by E	29 82	29 73	73	71	D.4	D.8	cloudy.	clear.	
24 19		NW	29 73	29 7	70	69	D.1	D.4	ditto.	cloudy.	In evening, wind W.
26 21		W	—	29 82	—	66	—	D.4	ditto.	clear.	Violent rain from 10 to 11 A.M.
27 22		W	—	29 92	—	64	—	D.6	—	ditto.	
28 23		N	29 93	30 —	69	63	D.4	D.6	clear.	ditto.	
29 24		N	30 —	30 02	66	64	D.5	D.6	cloudy.	cloudy.	
30 25		N	30 —	30 —	66	67	D.5	D.4	ditto.	clear.	
31 26		N by E	30 —	29 94	66	68	D.6	D.8	clear.	ditto.	

compared with London.

1793.

August.	Thermometer, 8 A.M.
1.....	58°.
2.....	60.
3.....	64.
4.....	60.
5.....	59.
6.....	60.
7.....	57.
8.....	60.
9.....	59.
10.....	61.
11.....	55.
12.....	57.
13.....	64.
14.....	56.
15.....	58.
16.....	58.
17.....	58.
18.....	53.
19.....	53.
20.....	52.
21.....	56.
22.....	58.
23.....	58.
24.....	54.
25.....	50.
26.....	51.
27.....	53.
28.....	57.
29.....	56.
30.....	57.
31.....	53.
Total..1766	

Greatest height of August.....64°.
Least ditto 51.

Observations near Lisbon

1793.

September.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Ob.
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1	27	—	—	29 98	—	67	—	D.15	—	clear.	Hot day.
2	28	N	29 97	29 97	70	66	D.13	D.7	clear.	ditto.	
3	29	N	29 94	29 92	70	64	D.13	D.5	ditto.	ditto.	
4	30	N	29 92	29 93	68	65	D.5	D.8	ditto.	ditto.	
5	1	N	29 92	29 93	65	62	D.8	D.8	ditto.	ditto.	
6	2	N by E	29 94	—	65	66	D.9	D.8	ditto.	ditto.	
8	4	N by E	—	29 97	—	64	—	D.5	—	cloudy.	Two P.M.
9	5	N N E	30 —	30 —	62	60	D.1	D.2	cloudy.	ditto.	thunder-st
10	6	W	30 04	30 04	61	64	med.	med.	rain.*	ditto.	heavy rain
11	7	W by S	30 05	30 07	65	61	med.	D.1	cloudy.	ditto.	violent win
12	8	W by S	30 1	30 08	63	63	W.2	D.1	ditto.	ditto.	upwards of
13	9	S W	30 1	30 05	64	63	W.1	med.	ditto.	ditto.	* Rain all the
14	10	S W	29 94	29 97	64	60	W.2	med.	ditto.	ditto.	Wind very hi
15	11	S W	—	30 1	—	58	D.2	D.3	ditto.	clear.	from 10 t
16	12	S W	30 18	30 25	62	61	D.2	D.5	ditto.	ditto.	Heavy rain
17	13	S	30 23	30 08	60	60	D.3	D.8	clear.	ditto.	
18	14	S W	30 04	29 99	63	62	D.6	D.10	ditto.	ditto.	
19	15	W	30 —	29 94	63	65	D.7	D.8	ditto.	ditto.	
20	16	N W	29 96	29 91	65	64	D.2	D.3	cloudy.	cloudy.	
21	17	N W	29 9	29 83	65	66	D.2	D.2	ditto.	ditto.	
22	18	W	—	29 94	—	58	—	D.6	—	ditto.	
23	19	N W	30 09	30 21	59	56	D.8	D.9	cloudy.	clear.	
24	20	N E	30 28	—	59	—	D.8	—	clear.	—	

467

compared with London.

1793.

September.	Thermometer, 8 A.M.
1.....	48°.
2.....	56.
3.....	54.
4.....	46.
5.....	43.
6.....	48.
7.....	40.
8.....	53.
9.....	55.
10.....	53.
11.....	50.
12.....	51.
13.....	57.
14.....	56.
15.....	56.
16.....	52.
17.....	48.
18.....	56.
19.....	50.
20.....	48.
21.....	44.
22.....	43.
23.....	42.
24.....	45.
Total..	
1204	

Greatest height between 1st and 24th of September..57°.

Least ditto.....40.

Observations near Lisbon

1793.

September.	Moon's Age.	Wind.	Barometer.		Thermometer.		Hygrometer.		Weather.		Miscellaneous Ob
			Morn.	Even.	Morn.	Ev.	Morn.	Even.	Morn.	Even.	
1	27	—	—	29 98	—	67	—	D.15	—	clear.	Hot day.
2	28	N	29 97	29 97	70	66	D.13	D.7	clear.	ditto.	
3	29	N	29 94	29 92	70	64	D.13	D.5	ditto.	ditto.	
4	30	N	29 92	29 93	68	65	D.5	D.8	ditto.	ditto.	
5	1	N	29 92	29 93	65	62	D.8	D.8	ditto.	ditto.	
6	2	N by E	29 94	—	65	66	D.9	D.8	ditto.	ditto.	
8	4	N by E	—	29 97	—	64	—	D.5	—	cloudy.	Two P.M.
9	5	N N E	30 —	30 —	62	60	D.1	D.2	cloudy.	ditto.	thunder-stc
10	6	W	30 04	30 04	61	64	med.	med.	rain.*	ditto.	heavy rain
11	7	W by S	30 05	30 07	65	61	med.	D.1	cloudy.	ditto.	violent win
12	8	W by S	30 13	30 08	63	63	W.2	D.1	ditto.	ditto.	upwards of
13	9	S W	30 13	30 05	64	63	W.1	med.	ditto.	ditto.	* Rain all the
14	10	S W	29 94	29 97	64	60	W.2	med.	ditto.	ditto.	Wind very hi
15	11	S W	—	30 1	—	58	D.2	D.3	ditto.	clear.	from 10 ti
16	12	S W	30 18	30 25	62	61	D.2	D.5	ditto.	ditto.	Heavy rain
17	13	S	30 23	30 08	60	60	D.3	D.8	clear.	ditto.	
18	14	S W	30 04	29 99	63	62	D.6	D.10	ditto.	ditto.	
19	15	W	30 —	29 94	63	65	D.7	D.8	ditto.	ditto.	
20	16	N W	29 96	29 91	65	64	D.2	D.3	cloudy.	cloudy.	
21	17	N W	29 9	29 83	65	66	D.2	D.2	ditto.	ditto.	
22	18	W	—	29 94	—	58	—	D.6	—	ditto.	
23	19	N W	30 09	30 21	59	56	D.8	D.9	cloudy.	clear.	
24	20	N E	30 28	—	59	—	D.8	—	clear.	—	

467

compared with London.

1793.

September.	Thermometer, 8 A.M.
1.....	48°.
2.....	56.
3.....	54.
4.....	46.
5.....	43.
6.....	48.
7.....	40.
8.....	53.
9.....	55.
10.....	53.
11.....	50.
12.....	51.
13.....	57.
14.....	56.
15.....	56.
16.....	52.
17.....	48.
18.....	56.
19.....	50.
20.....	48.
21.....	44.
22.....	43.
23.....	42.
24.....	45.
Total..	
1204	

Greatest height between 1st and 24th of September..57°.

Least ditto.....40.

No. XII.

*Thermometrical Observations taken in the Summer of
1793, at Braço de Prata, near Lisbon.*

June 10.—In an east room, from which the light and air	
were excluded	66°.
In the shade, but open air, at the same time	80.
In the sun, ditto	92.
25.—In the shade, open air, half-after six A.M.	70.
Noon	85.
One P.M.	86.
Two	87.
Three	85.
Four	82.
Five	78.
Nine	67.
Ten	65.
Thus a variation of more than twenty de-	
grees in the twelve hours.	
July 4.—In the shade, three P.M.	91.
5.—Ditto, ditto	91. 30'
16.—Ditto	80.
Not unpleasantly hot.	
22.—Two P.M. in open air	93.
Same time in the sunshine	113.
Ditto in a darkened room, with an eastern	
aspect	76.
23.—In the shade	95.
In the sunshine	121.
24.—Half-past twelve P.M.	95.
Three and four P.M.	90.
Aug. 10.—In the shade	97.
Sept. 1.—Ditto	89.

No. XIII.

*Thermometrical and Meteorological Register, kept at
Lisbon, from October 1, 1793, to January 25, 1794,
inclusive. Compared with the corresponding Tempera-
tures in London for the same period.*

Observations at Lisbon

1793.

Oct.	Thermometer.			Weather.
	Morn.	Noon.	Night	
1	60	—	—	A fine day.
2	60	70	55	Ditto.
3	62	74	54	A fine day, but too warm.
4	64	79	67	Ditto.
5	65	76	64	Ditto.
6	64	76	65	A delightful day, but rather too warm.
7	65	76	63	Ditto.
8	64	78	64½	Ditto.
9	64	74	63	Ditto.
10	64	76	63	Ditto.
11	64	72	64	A cloudy day, but pleasant.
12	64	72	59	Rain in the night, but a delightful day.
13	61	70	61	A delightful day.
14	61	74	64	A pleasant day, but cloudy.
15	64	73	64	A delightful day.
16	65	74	62	Heavy rain in the night and morning, but a fine day
17	62	72	57	A delightful day.
18	62	70	56	Ditto.
19	59	68	56	Fog all the morning, but a delightful evening.
20	61	70	65	A delightful day.
21	62	—	64	Ditto.
22	64	78	64	Pleasant, but cloudy.
23	63	—	64	A delightful day.
24	62	69	63	Ditto.
25	62	73	64	Ditto.
26	63	—	65	Showery all day.
27	65	—	63	Rain night and morning, but a fine day.
28	60	—	56	A delightful day.
29	58	—	53	Ditto.
30	57	—	58	Cloudy, but pleasant.
31	61	—	53	Rain and thick weather.

471

compared with London.

1793.

Oct.	Thermometer, 8 A.M.
1.....	60°.
2.....	49.
3.....	52.
4.....	53.
5.....	62.
6.....	60.
7.....	51.
8.....	54.
9.....	55.
10.....	51.
11.....	57.
12.....	56.
13.....	57.
14.....	58.
15.....	42.
16.....	55.
17.....	54.
18.....	47.
19.....	55.
20.....	50.
21.....	49.
22.....	53.
23.....	51.
24.....	49.
25.....	50.
26.....	59.
27.....	57.
28.....	41.
29.....	49.
30.....	38.
31.....	32.
Total..1609	

Greatest height of October 62°.
Least ditto 32.

Observations at Lisbon

1793.

Nov.	Thermometer.			Weather.
	Morn.	Noon.	Night	
1	61	67	63	Cloudy.
2	—	62	55	Ditto.
3	—	66	55	A fine day.
4	—	63	55	Ditto.
5	—	63	53	A delightful day.
6	—	64	59	Ditto.
7	—	65	59	Ditto.
8	—	59	53	Ditto.
9	—	66	60	Showery.
10	—	64	58	Very stormy, with rain.
11	—	67	62	A delightful day.
12	—	66	62	Cloudy and showery.
13	—	—	—	
14	—	64	—	A very pleasant day.
15	—	—	—	Showery, cloudy, and sunshine.
16	—	62	48	Cold, cloudy, and showery.
17	—	62	—	Showery, cold, cloudy, and sunshine.
18	—	61	—	
19	—	—	—	
20	—	—	—	Storms of rain, thunder, and lightning.
21	—	60	48	A delightful day.
22	—	59	—	Rain all last night and all day.
23	—	58	50	A fine morning, but showery all day.
24	—	56	48	Showery.
25	—	47	—	A fine day, but a little shower.
26	—	52	44	A thick fog all day, and cold.
27	—	—	45	A fine day.
28	—	—	50	Ditto.
29	—	—	—	A few drops of rain, and cold.
30	—	—	—	A fine clear day.

473

compared with London.

1793.

Nov.	Thermometer, 8 A.M.
1.....	33°.
2.....	30.
3.....	43.
4.....	42.
5.....	33.
6.....	40.
7.....	41.
8.....	33.
9.....	35.
10.....	48.
11.....	48.
12.....	34.
13.....	45.
14.....	42.
15.....	45.
16.....	46.
17.....	48.
18.....	51.
19.....	48.
20.....	50.
21.....	48.
22.....	42.
23.....	45.
24.....	44.
25.....	43.
26.....	42.
27.....	43.
28.....	46.
29.....	43.
30.....	42.
Total..1273	

Greatest height of November 51°.
Least ditto 30.

Observations at Lisbon.

1794.

Jan.	Thermometer.			Weather.
	Morn.	Noon.	Night	
1	—	58	47	Showery and cold.
2	45	52	40	Rain all night and all day.
3	40	50	42	A delightful day, but cold.
4	40	49	41	Fine, but cold.
5	41	50	42	Ditto.
6	38	49	45	Ditto.
7	43	53	43	Ditto.
8	39	50	40	Fine and cold in the day, at night rain and sleet.
9	41	54	47	A delightful day.
10	40	58	42	Ditto.
11	39	—	47	A fine day, though a little rain.
12	45	48	47	Showery and cold.
13	44	52	44	Cold.
14	43	—	46	Fine, but cold.
15	—	—	—	At 9 morn, at 1 noon, and 5 even. sunshine and warm.
16	—	—	—	Sunshine and warm all day.
17	—	—	—	Ditto.
18	—	—	—	Ditto.
19	—	—	—	Ditto.
20	—	—	—	Ditto.
21	—	—	—	Ditto.
22	—	—	—	Ditto.
23	—	—	—	Ditto.
24	—	—	—	Very fine in the morning, cloudy at 1 and 5 o'clock.
25	—	—	—	At 9 o'clock fine, showery till one, then fine.

477

compared with London.

1794.

Jan.	Thermometer, 8 A.M.
1.....	30°.
2.....	28.
3.....	31.
4.....	31.
5.....	33.
6.....	33.
7.....	33.
8.....	33.
9.....	24.
10.....	21.
11.....	33.
12.....	33.
13.....	32.
14.....	32.
15...	38.
Total..465	

Greatest height between 1st and 15th of January .. 38°.
Least ditto 21.

No. XIV.

Thermometrical and Meteorological Observations made at St. Jozè de Riba Mer, near Lisbon, from January 15, to April 16, 1794, inclusive. Compared with the corresponding Temperatures in London during the same period.

January 14th, 1794. Variation of the compass 25° , or $25^{\circ} 30'$, as taken this day by my Meridian Line made last year, and by Mr. Bell's, made some years ago.—W.W.

Observations near Lisbon.

1794.

Jan.	Thermometer.			Wind and Weather.		
	Nine A.M.	One P.M.	Ten Night	Nine A.M.	One P.M.	Five P.M.
15	—	53	44	NE clear.	Ditto.	Ditto
16	52	54	—	SE clear.	Fog on river	
17	52	53	42	SE ditto.	NE clear.	N clear
18	52	52	41	N ditto.	NE ditto.	Ditto
19	48	54	43	N clear.	N ditto.	Ditto
20	47	53	43	Clear.	E ditto.	N
21	49	52	41	NE ditto.	Ditto.	Ditto
22	51	54	42	SE	Fog on river.	SE
23	48	55	44	N clear.	NE	NE
24	45	56	47	SE fog on river and hills.		Cloudy
25	51	54	51	w cloudy.	Showers.	sw
26	52	52	42	nw flying clouds.		nw
27	54	53	50	s cloudy.	Some rain.	s
28	53	52	50	sw clouds and rain.		s
29	52	58	50	nw cloudy and rainy.		w
30	52	58	52	sw clouds.	Haze over river.	
31	48	54	52	N fog on river.	s clear.	

Greatest height of morning observations between Jan.
 16th and 31st, 1794 54° .
 Least ditto 45° .

Corresponding Observations in London.

. 1794.

January.	Thermometer, 8 A.M.
16.....	32°.
17.....	—
18.....	35.
19.....	37.
20.....	40.
21.....	40.
22.....	41.
23.....	40.
24.....	35.
25.....	36.
26.....	29.
27.....	32.
28.....	30.
29.....	33.
30.....	32.
31.....	49.
Total . 541	

Greatest height between 16th and 31st of January, 49°.

Least ditto 29.

Observations near Lisbon

1794.

Thermometer.				Wind and Weather.		
Feb.	Nine A.M.	One P.M.	Ten Night	Nine A.M.	One P.M.	Five P.M.
1	53	56	48	Rain very heavy last night.		"
2	51	54	47	sw clouds.	Ditto.	sw
3	47	52	46	" fog over river.	s clear.	clouds
4	46	54	51	" cloudy.		sw
5	53	—	49	Clouds.	"	bright evening
6	52	57	48	vw clear.		Ditto
7	52	57	47	Light clouds.	sw	clear
8	54	61	54	sw	clear.	sw
9	56	59	54	" clear.	sz clear.	Ditto
10	54	61	53	sz clear.	"	Ditto
11	56	61	55	sz clear.		Ditto
12	55	—	52	Ditto.		Ditto
13	53	60	54	Ditto.		Ditto sz
14	52	60	58	sz light fog.		sz clear
15	54	60	51	w clear.		sw clear
16	56	58	51	Fog on river.		sz clear
17	53	59	54	sz cloudy.		s cloudy
18	55	60	48	Ditto.	Rain	
19	54	59	51	sz flying clouds.	sw clear.	"
20	54	—	51	sz fog on river.		sz clear
21	49	55	50	e dense fog general.		sz
22	60	60	52	sz clear.	sz stormy	
23	57	59	48	nw flying clouds.		w clouds
24	58	—	51	sz ditto		nw cloudy
25	53	59	54	e fog on river.	sz clear.	w
26	61	65	60	nz clear.	e ditto.	Ditto e
27	60	61	59	sz light fog on river.		nw clear
28	60	63	50	s clear.	n clear	
Tot. 1508						

Greatest height of February..... 61°.

Least ditto 46.

compared with London.

1794.

February.	Thermometer, 8 A.M.
1.....	48°.
2.....	45.
3.....	41.
4.....	37.
5.....	39.
6.....	41.
7.....	39.
8.....	43.
9.....	43.
10.....	44.
11.....	41.
12.....	50.
13.....	47.
14.....	49.
15.....	51.
16.....	47.
17.....	46.
18.....	44.
19.....	39.
20.....	45.
21.....	53.
22.....	50.
23.....	46.
24.....	49.
25.....	50.
26.....	49.
27.....	46.
28.....	44.
1266	

Greatest height of February 53°.

Least ditto 37.

Observations near Lisbon

1794.

Mar.	Thermometer.			Wind and Weather.		
	Nine A.M.	One P.M.	Ten Night	Nine A.M.	One P.M.	Five P.M.
1	56	60	51	N clear.	SE clear.	SW rain
2	54	55	48	N flying clouds.	Cold wind.	Clear
3	56	57	50	SE clear.	E clear.	Ditto
4	54	60	—	N clear.	Ditto	
5	51	58	52	NE rain.	Ditto.	Clear
6	56	61	54	N clear.		NE ditto
7	58	—	55	N ditto.		NW ditto
8	57	61	52	NE clear.	SE	SW
9	56	63	54	NE cloudy.	NE	SW
10	62	62	55	NE clear.	S ditto.	SW
11	59	64	50	N ditto.		SW
12	56	56	52	SW cloudy.		N cloudy
13	56	58	50	N clear.		N very high
14	56	61	51	N clear.		Clear
15	58	62	50	N clear.		SE ditto
16	55	60	51	E clear.	W clear.	N clear
17	59	62	51	N clear.	Ditto.	Ditto
18	58	62	54	W cloudy.	NW clear.	N cloudy
19	60	62	49	N few clouds.	N	N
20	60	62	50	N clear		
21	58	62	50	N ditto high.		NE clouds
22	60	62	51	N clear.	Few clouds.	W cloudy
23	62	62	52	Cloudy.	S cloudy.	
24	55	59	53	NE foggy.	E clear.	Ditto
25	61	66	59	E clear		
26	60	68	54	NE cloudy		
27	60	64	54	N clear.	SE cloudy.	N
28	60	62	52	SE cloudy.	Clear.	Ditto
29	61	64	56	S cloudy		
30	59	62	—	N clear		
31	62	64	54	W few clouds.	N cloudy.	N
Tot.	1795					

Greatest height of March..... 62°.
Least ditto..... 51.

483

compared with London.

1794.

March.	Thermometer, 8 A.M.
1.....	43°.
2.....	45.
3.....	46.
4.....	50.
5.....	47.
6.....	40.
7.....	42.
8.....	39.
9.....	45.
10.....	44.
11.....	50.
12.....	45.
13.....	36.
14.....	43.
15.....	50.
16.....	50.
17.....	42.
18.....	43.
19.....	45.
20.....	45.
21.....	40.
22.....	42.
23.....	43.
24.....	44.
25.....	41.
26.....	42.
27.....	45.
28.....	45.
29.....	50.
30.....	49.
31.....	49.
Total..1380	

Greatest height of March 50°.

Least ditto 36.

Observations near *Lisbon*

1794.

April.	Thermometer.			Wind and Weather.		
	Nine A.M.	One P.M.	Ten Night	Nine A.M.	One P.M.	Five P.M.
1	62	65	56	s clear.	s	sw
2	65	66	56	sz clear		
3	56	63	56	sz ditto.		s clear
4	55	62	—	n cloudy		
5	58	60	48	n clear		
6	60	63	56	sw clear.		s clear
7	56	63	56	s cloudy.		sw cloudy
8	60	63	55	s rainy.	Stormy.	w stormy
9	55	55	49	n clear.	NE cloudy.	
10	56	58	50	Ditto.	High.	
11	54	59	51	Ditto.		NE very high
12	59	62	53	NE clear.		
13	—	62	51	n clear.		NE clear
14	62	64	53	Ditto.	s clear.	nw ditto
15	62	68	53	Ditto.	n ditto.	Ditto
16	62	—	—	n cloudy.		
Tot.	937					

Greatest height between the 1st and 16th of April..... 65°.

Least ditto 54.

485

compared with London.

1794.

April.	Thermometer, 8 A.M.
1.....	43°.
2.....	44.
3.....	48.
4.....	45.
5.....	44.
6.....	49.
7.....	49.
8.....	47.
9.....	45.
10.....	44.
11.....	46.
12.....	44.
13.....	45.
14.....	48.
15.....	51.
16....	48.
Total..740	

Greatest height between 1st and 16th of April 51°.

Least ditto..... 43.

No. XV.

Observations on the Temperature of Springs near Lisbon.

A draw-well in the garden of the German, or Boulnois' Hotel, in the Calçada d'Estrella, Lisbon, the whole depth of which is 45 feet; viz. 30 feet pound of water, and 15 feet from the mouth of the well to the surface of the water, on the 13th of November indicated a temperature of $60^{\circ} 30'$ of Fahrenheit's thermometer. The thermometer was put into a pint cup; this cup was lowered down until it was about half a yard under the surface of the water. After waiting several minutes, the cup was drawn up filled with water, and the thermometer in it stood at 60° or a little more.

The cup, &c. were then lowered down to near the bottom of the well, and when drawn up, after remaining several minutes at the depth of 44 feet, the temperature appeared the same as in the former experiment.

At this time the thermometer in the shade, in the open air, stood at 64° .

The 14th Dec. a thermometer in the open air, in the shade, stood at 52° , which had been nearly the temperature for ten days before, but in the water in the well it indicated as before $60\frac{1}{2}^{\circ}$.

In Mr. Brander's garden, at St. Jozè, six miles below Lisbon, there is an open well, but covered from the rain, the whole depth of which is 41 feet; viz. 11 feet pound of water, and 30 feet from the mouth of the well to the surface of the water.

On the 5th February, 1793, the thermometer in the open air stood at 61° ; in the water in the well at $54^{\circ} 30'$.

The difference of 6° of the thermometer between this water and that at Lisbon, can only be accounted for by supposing that the higher temperature of the latter is caused by the same sub-

terranean heat which in the lower and more eastern part of Lisbon raises one spring to 73° and another to 86° .

March 17th. This was further confirmed by the temperature of the well in the garden at Braço de Prata, about three miles east of Lisbon. This well is 63 feet in its whole depth; viz. 33 feet down to the water, and 30 feet the pound of water. The thermometer plunged into a bucket of this water indicated 55° ; at the same time it stood in the open air at 60° .

Mr. Bulkeley's well, at Val Formosa, near Braço de Prata, in January, 1794, showed a temperature of 55° , by a Ramsden's thermometer.

In the months of May, June, August, September, and October, the mean heat of Lisbon was $16^{\circ} 30'$ above that of Edinburgh; but on the 12th of October, 1791, the atmosphere at Lisbon was $3\frac{1}{2}^{\circ}$ colder than on the same day in Edinburgh; viz. at Lisbon $65^{\circ} 30'$, at Edinburgh 69° .

Foliation of Trees.

1794.

Ash Tree (*Fraxinus excelsior*) leafed at Edgbaston, Warwickshire, May 19th.

Ditto at Penzance, Cornwall, May 3d.

Ditto at St. Jozè de Riba Mer, near Lisbon, February 28th.

Ditto on the south side of the Tagus, opposite St. Jozè, February 24.

Elm tree (*Ulmus campestris*) leafed at Edgbaston, May 4th.

Ditto at Oeyras, near Lisbon, March 7th.

The Vine (*Vitis vinifera*) leafed at Edgbaston, May 19th.

Ditto in Cornwall, full, May 14th.

Ditto at St. Joze, March 1st.

February 24th reaping rye on the south side of the Tagus, near Porto Brandao.

Observations at Cintra.

No. XVI.

CINTRA is 16 miles west from Lisbon ; it stands on the north-west side of the mountain commonly called the Rock of Lisbon, nearly half-way between the level of the sea and the summit of the mountain, at about a mile and a half distant from the Atlantic Ocean.

The vapours from the sea are often attracted by the mountain, and rest on its summit like a canopy for whole days, sheltering Cintra from the fierce rays of the sun, while Lisbon, and even the country at half a mile distance only to the east of the mountain, are exposed to their full power. The number of trees and rills of water also contribute to its refreshing coolness.

In the summer months, in the year 1790, the temperature of the atmosphere at Cintra was never less than 6° below that at Lisbon.

Mean heat from beginning of June to the end of September, 1790, at Cintra, was 9° less than at Lisbon.

Heat of Cintra, at Two o'Clock P. M. in a Room looking westerly.

1790.

Day.	June.	July.	Aug.	Sept.	Day.	June.	July.	Aug.	Sept.
1	—	66°	67°	69°	17°	65	77°	69°	66°
2	—	66	67	69	18	65	69	70	65
3	—	66	67	67	19	66	69	70	65
4	—	66	67	66	20	73	68	78	65
5	—	65	69	64	21	77	69	70	63
6	—	64	70	64	22	73	67	69	64
7	73°	66	70	62	23	72	66	69	66
8	71	66	71	61	24	75	68	69	67
9	65	70	70	62	25	71	74	70	70
10	63	73	70	64	26	68	77	74	74
11	63	65	68	68	27	66	73	—	70
12	63	65	68	69	28	66	69	—	74
13	59	65	69	68	29	66	67	—	—
14	63	65	70	65	30	65	64	66	—
15	67	68	69	65	31	—	66	68	—
16	65	75	70	67					
						Tot.	2108		

No. XVII.

*Observations at Cadiz, by E. Moore, M.D. with corresponding Observations at Lisbon, by Dr. Withering.**

1793.

- Nov. 6.—Clear and warm.
 7.—Ditto, very ditto.
 8.—Ditto, ditto.
 8.—Ditto, ditto.
 10.—Heavy and cloudy—rather cold.
 11.—Cloudy and cold.
 12.—Ditto, ditto.
 13.—Ditto, with showers of small rain.
 14.—Unpleasant foggy weather.
 15.—Constant rain all day.
 16.—Almost the same as yesterday, but at short intervals was fair.
 17.—Constant showers of rain—weather chilly and cold.
 18.—Ditto, ditto, ditto.
 19.—Small showers of rain—cold—very high wind.
 20.—Ditto.
 21.—Rain at times—not so cold.
 22.—Warmer, but thick mizzling weather.
 23.—Clear pleasant weather.
 24.—Ditto.
 25.—Ditto.
 26.—Ditto.
 27.—Ditto.
 28.—Ditto.
 29.—Close heavy weather—during the night past very heavy rain.
 30.—Clear pleasant weather.

* Vide p. 472 and 474.

*State of Weather at Cadiz.***1793.**

- Dec.** 1.—Clear, but rather cold.
 2.—Ditto, very cold.
 3.—Ditto, warm and pleasant.
 4.—Ditto, ditto.
 5.—Ditto, ditto.
 6.—During the night past came on a Levant wind, showers of rain, wind high, very cold.
 7.—The same as yesterday.
 8.—Ditto.
 9.—Very cold, much wind, but no rain.
 10.—Rather warmer, but unpleasant and rainy.
 11.—Ditto, ditto.
 12.—Cloudy, with showers of rain.
 13.—Warm, with mizzling rain.
 14.—Cloudy—much wind.
 15.—Showers of rain, but at intervals clear and pleasant.
 16.—Morning heavy rain,—afternoon clear and pleasant.
 17.—Cold clear weather.
 18.—Ditto.
 19.—Ditto, much wind.
 20.—Ditto, ditto.
 21.—Ditto, ditto.
 22.—Rainy, very cold weather.
 23.—Clear, but cold.
 24.—Ditto, ditto.
 25.—Pleasant and warm.
 26.—Ditto.

Observations at Cadiz, by E. Moore, M.D.

1794.

Feb.	Thermometer.			Weather.
	One Noon.	Seven Even.	Wind.	
12	64	59	NE	Clear.
13	67	60	SE	Clear.
14	65	59	W	Morning and evening clear, thick fog at noon, for half an hour: a rare occurrence.
15	67	59	SE	Clear.
16	65	59	E	Clear.
17	65	59	E	Clear.
18	64	59	SE	Clear.
19	67	59	SE	Clear.
20	65	59	W	Clear.

Corresponding Observations at Lisbon, by Dr. Withering.

1794.

Feb.	Thermometer.			Weather.
	One Noon.	Seven Even.	Wind.	
12	—	52	N	Clear.
13	60	54	SE	Clear.
14	60	58	SW	Clear.
15	60	51	SE	Clear.
16	58	51	S	Clear.
17	59	54	SE	Cloudy.
18	60	48	SE	Clouds and rain.
19	59	51	S	Clouds.
20	—	51	SE	Clear.

Hence it appears that the mean temperature at Cadiz was from 7° to 8° higher than at Lisbon, but is really only 5 or 6, after correcting the errors of the instruments.

No. XVIII.

Temperature of Hieres, by John Nott, M.D.*

Observations taken at 8 A.M. and 2 P.M.

1786.

Nov				Weather.	Dec				Weather.
Day	Mn.	Ev	wind		Day	Mn.	Ev	wind	
10	45	50	—	Sun.	6	—	67	SW	Rain.
11	43	49	—	Sun.	7	—	61	E	Rain.
12	47	54	E	Cold.	8	—	61	SW	Soft.
13	49	55	SW	Warm.	9	57	59	E	Cloudy.
14	50	50	—	Rain.	10	58	61	NE	Mist and rain.
15	52	56	E	Rain.	11	58	60	NE	Rain.
16	53	57	SE	Rain.	12	55	57	N	Sun.
17	50	56	SW	Sun.	13	60	61	N	Sun.
18	48	55	NE	Rain.	14	63	55	NW	Sun.
19	49	55	N	Showers.	15	57	52	NW	Sun.
20	49	55	NW	Sun.	16	46	51	NW	Sleet.
21	51	59	NE	Sun.	17	43	45	NW	Sun.
22	53	60	N	Sun.	18	43	49	NW	Sun. Ice $\frac{1}{2}$ inch.
23	50	59	SW	Sun.	19	39	39	NW	Rain.
24	50	57	SE	Rain.	20	43	52	W	Sun.
25	53	59	NE	Rain.	21	41	45	N	Sun.
26	51	55	E	Rain.	22	39	41	NW	Sun. Frost.
27	53	53	E	Cloudy.	23	41	43	NW	Ice two inches.
28	52	55	NE	Showers.	24	41	45	E	Cold and raw.
29	51	47	NE	Sun and Rain.	25	39	88	E	Cold. Rain.
30	51	55	N	Sun.	26	39	11	E	Damp. Rain.
Dec					27	49	53	N	Ditto. Ditto.
1	51	47	E	Sun.	28	43	45	NW	Sun. Warm.
2	50	54	NE	Sun.	29	45	49	NW	Ditto. Ditto.
3	—	57	NW	Sun.	30	54	58	NW	Ditto. Ditto.
4	—	59	SW	Sun.	31	49	45	NW	Sun.
5	—	60	E	Rain.					

* The town so called is here meant. . This small town on the continent, a league from the sea, and enjoying a delightful climate, is often confounded with the islands of the same name, which are barren and nearly uninhabited. —ED.

Temperature of Hieres.

1787.

Jan. Thermometer				Weather.	Feb. Thermometer.				Weather.
Day	Mn.	Ev	wind		Day	Mn.	Ev	wind	
1	52	—	NE	Sun.	12	50	58	W	Cloudy. Moist.
2	42	49	N	Sun.	13	50	62	W	Clear. Sun.
3	43	51	NE	Sun.	14	52	58	SW	Bright. Cold.
4	41	48	NW	Frosty.	15	52	58	SW	Warm. Clear.
5	46	50	N	Frost. Clear.	16	49	54	W	Fine. Warm.
20	48	54	NW	Mild.	17	54	57	W	
21	49	58	NW		18	50	58	W	Warm. Sun.
22	40	62	NW		19	52	62	E	Sun.
23	48	51	SE	Cloudy.	20	50	62	SW	Sun.
24	46	52	NE	Fine.	21	50	55	NE	Cloudy.
25	48	54	SE	Cloudy.	22	50	54	E	Cloudy. Rain.
26	40	38	E	Rain. Snow.	23	52	52	E	Cloudy. Moist.
27	32	38	NW	Hard frost.	24	44	56	SE	Warm. Sun.
28	38	44	E	Clear hard frost	25	44	56	SE	Sun.
29	48	56	N	Warm. Bright.	26	48	54	E	Cloudy. Cold.
30	48	56	N		27	48	54	E	Ditto. Ditto.
31	44	55	NE	Sun. Cold wind.	28	49	62	W	Fine. Cold.
					Tot 1366				
Feb.					Mar.				
1	42	48	SW	Warm. Sun.	1	50	63	NW	Fine. Warm.
2	44	60	N	Ditto. Ditto.	2	48	57	NE	Rainy.
3	50	57	NW	Cloudy. Warm.	3	49	57	SW	Fine. Cloudy.
4	44	54	N		4	53	60	W	Sun. Wind.
5	48	58	NW	Bright sun.	5	53	60	W	Ditto. Ditto.
6	47	59	NW		6	54	66	NW	Fine. Warm.
7	51	56	NW	Cloudy. Warm.	7	58	61	W	Bright. Cold.
8	54	60	NW	Ditto. Ditto.	8	50	68	W	Fine. Hot.
9	50	59	W	Warm. Sun.	9	49	50	W	Fine.
10	52	54	E	Cloudy. Rain.	10	56	58	W	
11	50	58	E	Ditto. Ditto.	11	50	61	W	

No. XX.

*Communication from Dr. Haygarth respecting
Hydrophobia.*

Near Wrexham, in North Wales, three men died of canine madness, in October and November, 1768.

These melancholy cases spread a general alarm. But it is not to give great comfort and satisfaction to any one who has been bit, to know that there is a safe, easy, and effectual method of preventing infection, which can seldom give pain, require skill, and is in the power of every person to employ. It is universally allowed by physicians, that the spittle of a mad animal, infused into a wound, is the *only* cause, hitherto known, that can communicate canine madness to the human body. This poison does no immediate mischief, but is slowly absorbed into the blood, and sufficient opportunity is given to remove it, before any danger can arise. Whenever a person is bit, the plain and obvious means of preventing future injury is, first, to wipe off the spittle with a dry cloth, and then to wash the wound with cold water, not slightly and superficially, but abundantly, and with the most persevering attention; in bad cases, for several hours. After a plentiful affusion of cold water, warm water may be employed with safety and advantage: a continued stream of it, poured from the spout of a tea-pot or tea-kettle, held up at a considerable distance, is peculiarly well adapted to the purpose. After the bite has been carefully washed, colour it with spittle tinged by ink, &c. When some hours have elapsed, wash out the stain. A visible proof may thus be obtained, how soon and perfectly water can cleanse the wound from spittle.

As a proof that slight washing of the wound is not sufficient to cleanse it effectually from the poison, we may mention, that, in

No. XIX.

Comparison of Phases of the Moon with Changes of the Weather, from January 6 to December 25, 1780.

Jan.	6.—New Moon.	A little rain on that day—fair before and after.
	21.—Full.	Fair and frosty before and after.
Feb.	5.—New.	Slight rains before and after.
	20.—Full.	Snow before and after.
March	6.—New.	Slight rain before and after.
	20.—Full.	Slight rain, but fair after.
April	4.—New.	Snow before, fair after.
	18.—Full.	Rain before and after.
May	4.—New.	A little rain, but fair two days before and two after.
	18.—Full.	Rain before, fair after.
June	3.—New.	Fair before and after.
	17.—Full.	Rain before and after.
July	2.—New.	Fair before and after.
	16.—Full.	Very slight rain before and after.
	31.—New.	Fair before and after.
Aug.	15.—Full.	Fair, but rain after.
	29.—New.	Fair before and after.
Sept.	13.—Full.	Rain, but fair for one day after.
	28.—New.	Slight rains before and after.
Oct.	13.—Full.	Slight rain before and after.
	27.—New.	Very slight rain before, fair after.
Nov.	12.—Full.	Fair on the day, slight rain before and after.
	26.—New.	Light rain before and after.
Dec.	18.—Full.	Fair before and after.
	25.—New.	Frost before, fair after.

Hence it appears that out of thirteen new moons, only five were attended by any change of weather, and that out of twelve full moons only four or at most five were accompanied by any alteration.—W. W.

No. XX.

*Communication from Dr. Haygarth respecting
Hydrophobia.*

NEAR Wrexham, in North Wales, three men died of canine madness, in October and November, 1788.

These melancholy cases spread a general alarm. But it ought to give great comfort and satisfaction to any one who may be bit, to know that there is a safe, easy, and effectual method of preventing infection, which can seldom give pain or require skill, and is in the power of every person to employ. It is universally allowed by physicians, that the spittle of a mad animal, infused into a wound, is the *only* cause, hitherto known, that can communicate canine madness to the human body. This poison does no immediate mischief, but is slowly absorbed into the blood, and sufficient opportunity is given to remove it, before any danger can arise. Whenever a person is bit, the plain and obvious means of preventing future injury is, first, to wipe off the spittle with a dry cloth, and then to wash the wound with cold water, not slightly and superficially, but abundantly, and with the most persevering attention; in bad cases, for several hours. After a plentiful affusion of cold water, warm water may be employed with safety and advantage: a continued stream of it, poured from the spout of a tea-pot or tea-kettle, held up at a considerable distance, is peculiarly well adapted to the purpose. After the bite has been carefully washed, colour it with spittle tinged by ink, &c. When some hours have elapsed, wash out the stain. A visible proof may thus be obtained, how soon and perfectly water can cleanse the wound from spittle.

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